IRON AGE

THE NATIONAL METALWORKING WEEKLY A Chilton Publication DECEMBER 21, 1961

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Competition Grows in Cryogenics p. 27

Carbide Bearings Take Rough Use p. 57

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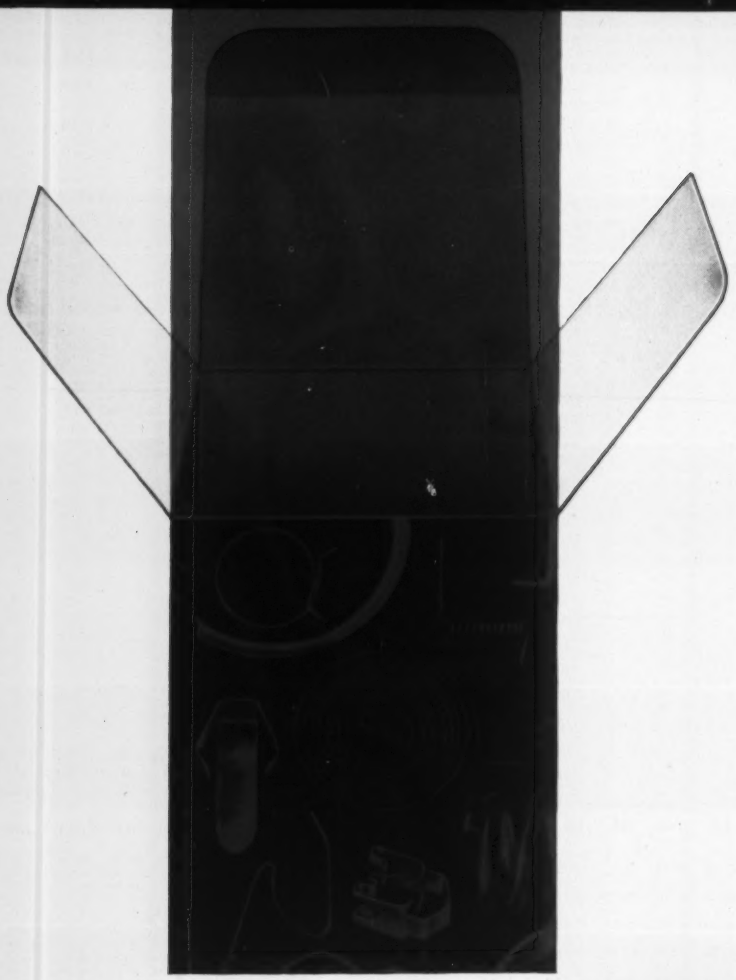

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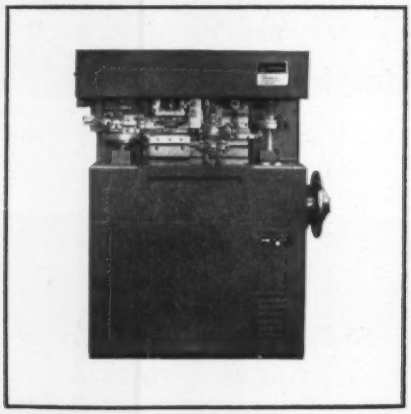

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Indexed in Applied Science & Technology Index, Engineering Index and Business Periodicals Index

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The IRON AGE, published every Thursday by CHILTON COMPANY, Chestnut & 56th Sts. Philadelphia 39, Pa. Second class postage paid at Philadelphia, Pa. Price to the metalworking industries only $2 for 1 year, $3 for 2 years in U.S. Canada $10, all others $15 for one year. Latin America $25. Other foreign $35. Single copies 50¢. Annual Issue $2. Cable: Chilton Philadelphia.

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Special This Week

Secretary Dillon on Business Taxes

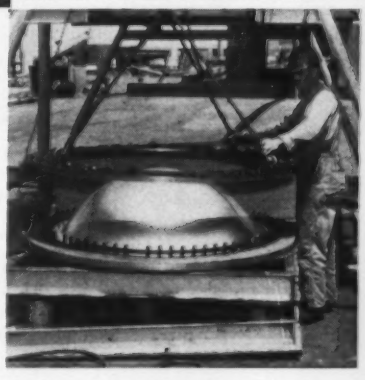
In an exclusive Iron Age interview, Treasury Secretary Douglas Dillon speaks out on one of the Vital Issues facing management in 1962: Business taxes. He discusses one of the metalworking's long-time problems—depreciation reform. He also talks of foreign income, lobbying, and chances for overall tax reform. p. 37

Scramble for Cryogenics Market

Cryogenics tanks are in the midst of a spectacular growth. And behind the scenes a battle is raging among metal producers seeking a share of this potential $1 billion market. Nine pct nickel alloy especially bears watching. p. 27

Carbide Bearings Curb Wear in Pumps

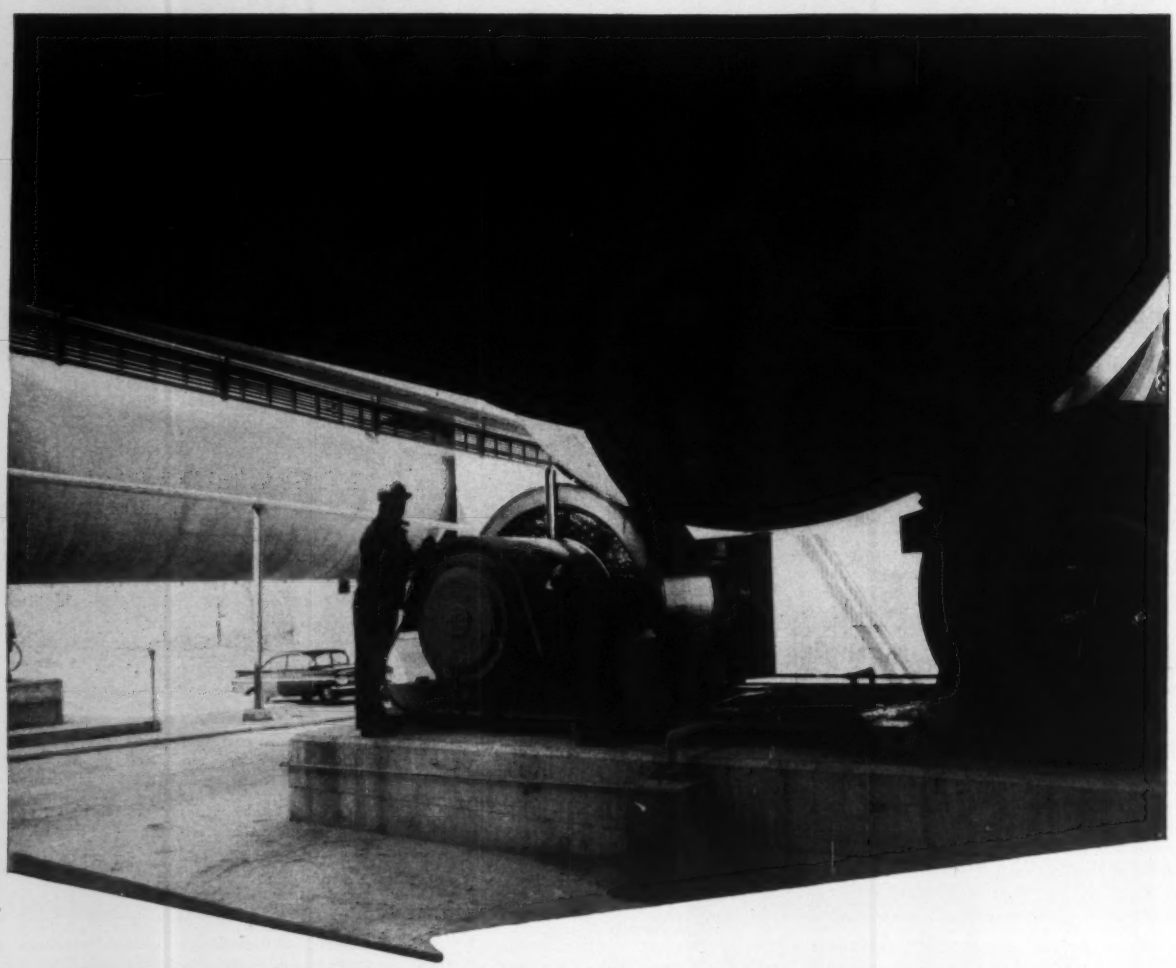
Pumps must face increasingly tougher operating conditions. A three-year test program points up how carbides solve wear problems in pump bearings. C. H. Diehl, R & D Director, C. H. Wheeler Mfg. Co. discusses the results of extensive tests. p. 57



Next Week

Fluid Pressure Shapes Missile Parts

Water and other fluids serve as sophisticated metalforming tools at General Dynamics/Astronautics, San Diego. Next week's report tells how a new low-cost process, called decoction forming, maintains any forming-cycle temperature from —400° to 2700°F.



Here's a Bearings, Inc. survey that is saving our customer "endless hours"*

A letter from our customer, Mr. D. G. Shanks, Service Superintendent, Dundee Cement Company, Dundee, Michigan, tells the story far better than we ever could! We quote Mr. Shanks:

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"We recall the many days your men labored climbing over machinery, collecting information and the problems they encountered in obtaining all the bearing specifications.

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Steel Labor Struggle: Will It Settle Anything?

The pressures are building up for the steel labor battle. While public utterances—so far—are mild, that is not the whole story.

Privately, steel management is laying its plans. So is the union. While these two giants are trying to gage each other's strength, the White House is doing its own figuring.

That too many people believe the President is the one who will settle the steel hassle is bad—both for management and for the union. That the union can't see this is poor thinking for the long haul.

When a steel leader says that his industry is fighting for survival, it is greeted with Bronx cheers from the union side. That is short-sightedness. The steel industry is fighting for survival. No one thinks it will go broke, or that tomorrow there will be no industry if the union gets a "good" settlement.

But that isn't the whole story. The steel industry is up front as a symbol as to what will happen to all industry in the future. What happens in steel this coming year will affect seriously all metalworking industry.

But the union pitch is always a "current" or near-term one. It does not take into consideration that what it drives for will bring about the very things it doesn't really want — unemployment, more automation, and less world business for American metalworking plants.

Just how to get this across to union leaders is the problem for the steel industry. With communication being tough in one's own family—let alone from management to the union—the job is awful in its magnitude.

The industry will try to get its point across. But the union chiefs have always gone on the premise that the steel industry was fat enough to pay for any package and even hold prices.

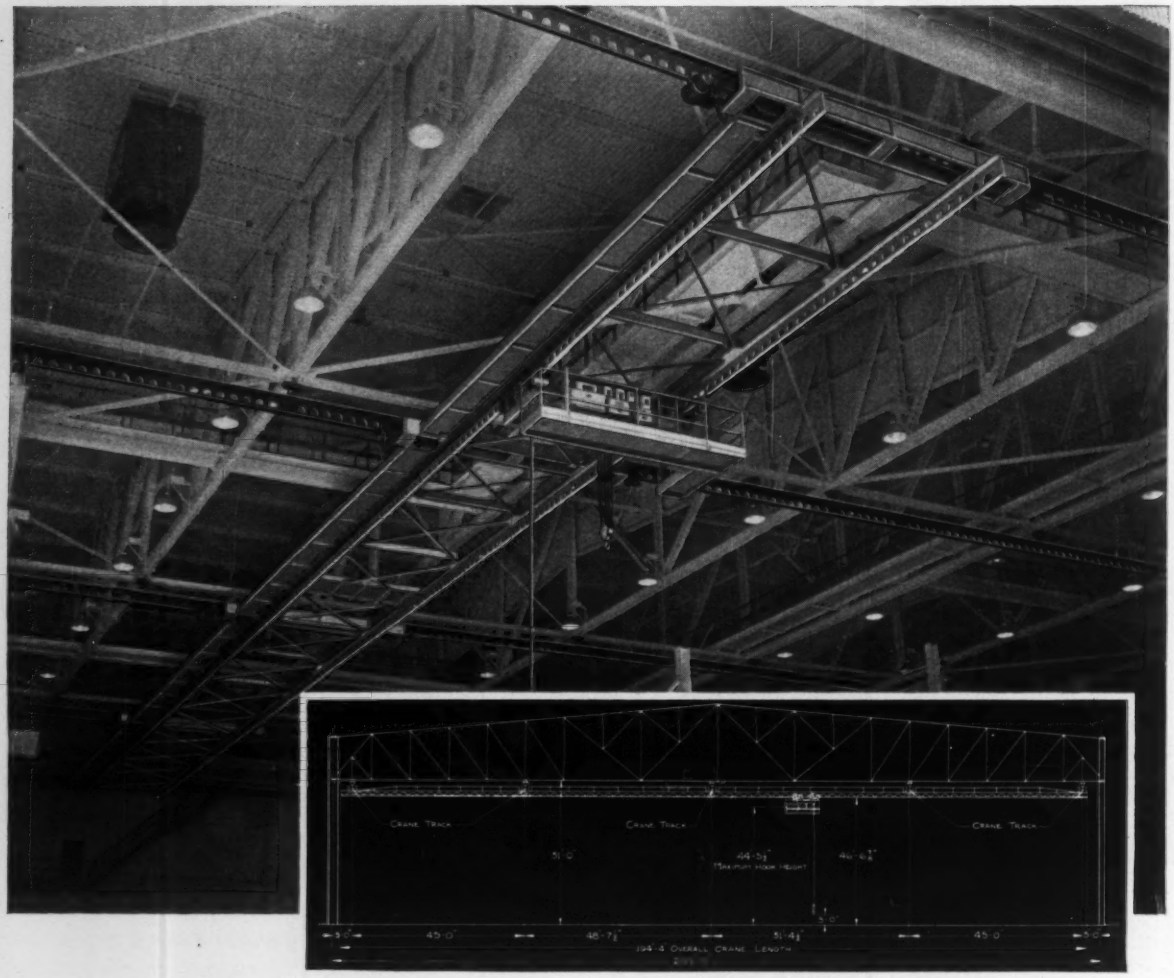
Such thinking could be disastrous for every steel company, every steel worker, and for every union chief. Unless it changes next year, the long-term outlook for the steel industry, its customers, and its workers is bleak.

The worst thing that can happen is to see unwarranted and "expedient" interference by government in the steel labor picture—no matter in what form.

Next year's steel settlement may be the point of no return—for steel and for labor.

Tom Campbell

Editor-in-Chief



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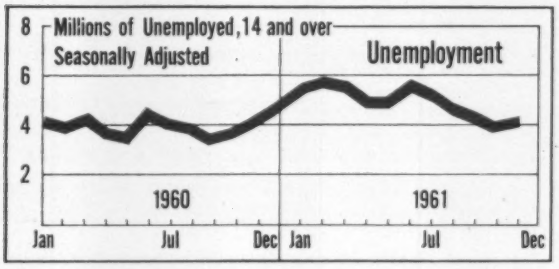
Jobless Rate Drops In November

The unemployment rate in mid-November dropped to 6.1 pct of the labor force, down from 6.8 pct in October. This is the biggest drop scored in three years. And it snaps an 11-month jobless rate that hovered near 7 pct.

Actually, there were more jobless in November than



in October—some 90,000 more. But the reason for the rate drop was that the jobless rise was less than seasonal.

Employment data is now becoming reconciled with the production index of the Federal Reserve Board. William McChesney Martin, Jr., chairman, stated last week that the index broke through to 114 in November. This is a record. The index in October stood at 113.1.

Based on seasonal factors, the jobless rate is expected to hit 4 million in December, and 5 million in January-February.

Construction Outlook Is Good

Construction spending in November hit a record annual rate of $59.5 billion. This is a jump of $600 million over the October rate, seasonally adjusted.

In a new Commerce Dept. analysis of the construction industry, more records are indicated for 1962. Department officials say 1962 construction expenditures may reach $60 billion.

Private residential construction, says the department, should climb from the 1961 level of $22.5 billion to $24 billion. Non-residential building should run at $11.1 billion, up from $10.7 billion in 1961.

Public construction is expected to rise about $750 million to $18 billion.

Challenge Faces Durable Goods

Some durable goods makers are not loudly cheering the present recovery in their business. These are the executives who look at long-term trends. Two signs they note:

Since 1950, personal consumption expenditures for durables have dropped from 16 pct of total personal spending to 12 pct.

Also since 1950, investment in producers durable equipment has dropped from 6.7 pct of the GNP mix to 4.9 pct.

The market shift to non-durables and services puts a crimp on growth and a lid on profits for many producers of durable goods. Since 1950, durable goods producers' profits have declined 6 pct; non-durable goods producers' profits have risen 3.5 pct.

A safe forecast for the coming year appears to be that diversification efforts among durable goods makers will continue—and probably expand. This will probably happen even though durables are headed for a good year.

More Savings Needed For Growth

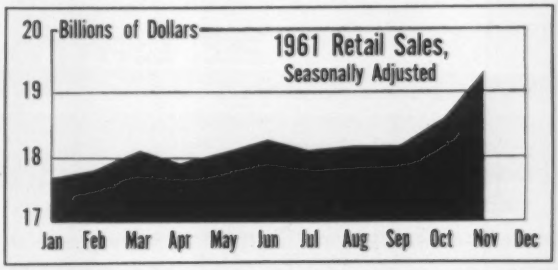
Not enough money is being saved in the U. S. to provide for continued economic growth. This is a finding of Prof. S. Kuznets of Harvard and the National Bureau of Economic Research. In a major study soon to be issued, he finds the outlook is for "continued pressure on the supply of savings available for investment."

Dr. Kuznets warns that this pressure is likely to be a spur to inflation, unless policies to mitigate it are adopted.

Retail Sales Score New Record

Retail sales made their expected breakthrough in November. Sales for the month rose to $19.3 billion, up from $18.6 in October.

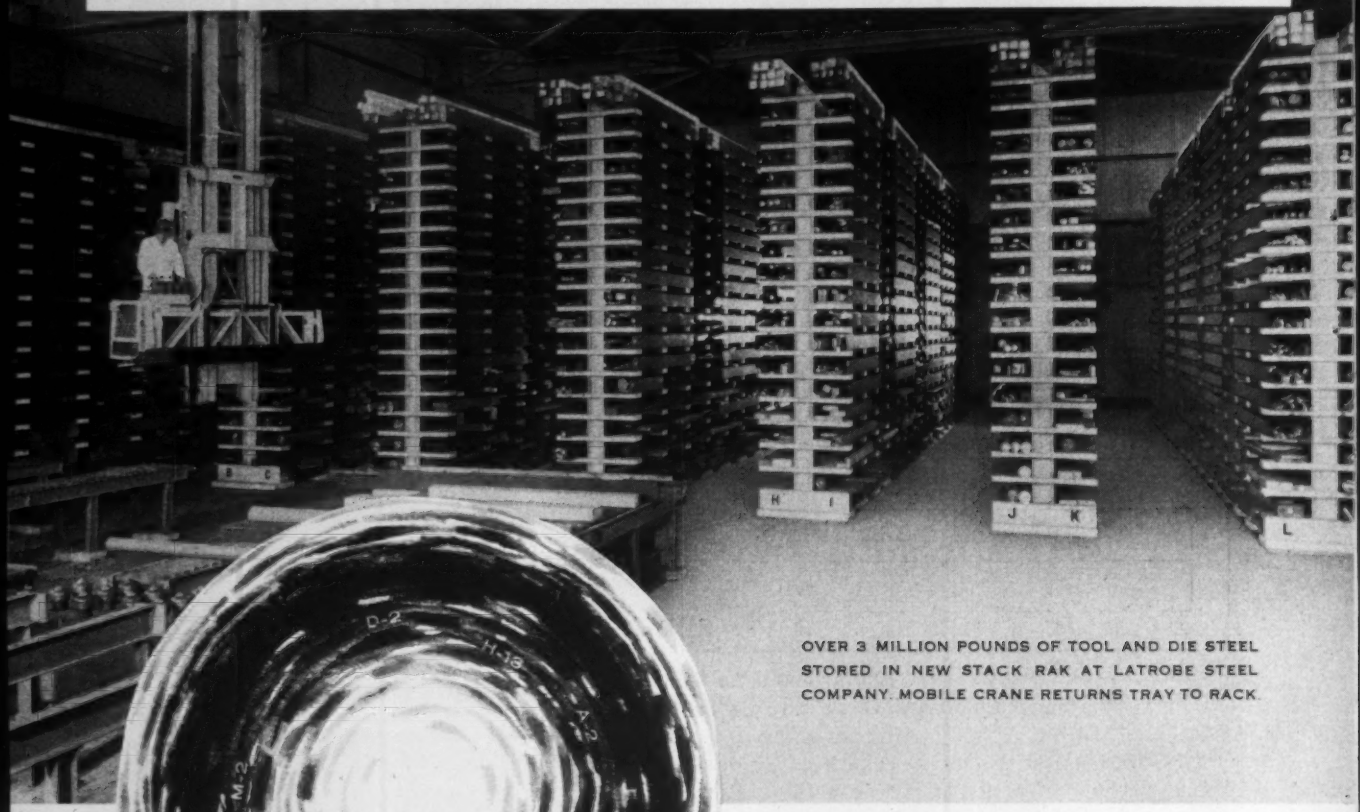
And November sales were the highest ever made.



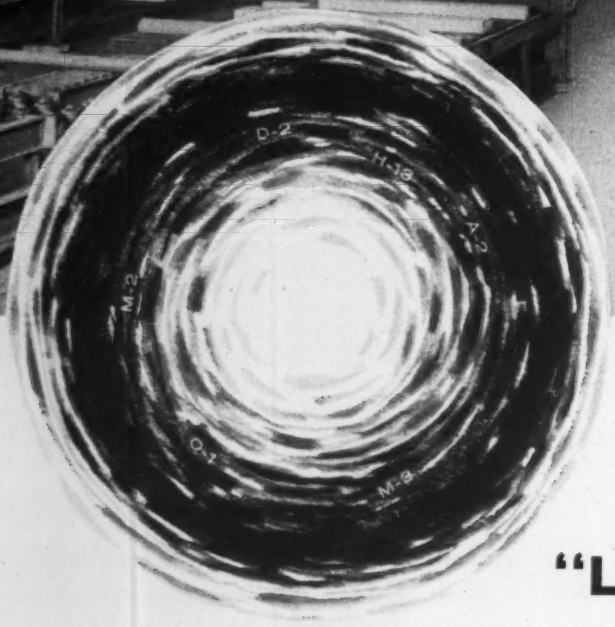
The previous record of $18.9 billion was made in April 1960.

Retailers are reported as showing new optimism after two successive monthly rises of 3 pct. And leading in the November rise were autos and other durables. Durables sales were $6.3 billion for the month, a 7 pct rise over October.

AT LATROBE... PROGRESS HAS THE GREEN LIGHT



OVER 3 MILLION POUNDS OF TOOL AND DIE STEEL STORED IN NEW STACK RAK AT LATROBE STEEL COMPANY. MOBILE CRANE RETURNS TRAY TO RACK.



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Minimum Wage Gains Totaled

Some of the scope of the 1961 amendments to the Fair Labor Standards Act has been totaled by the Dept. of Labor.

The amendments, effective Sept. 3, increased the minimum wage for 24 million previously covered workers from $1 to $1.15 per hour. Of this number, about 1.9 million were receiving less than $1.15. On an annual basis, the increase for them will amount to $336 million for the first year.

By extending the coverage, 3.6 million additional workers came under the minimum wage. Of these, an estimated 663,000 were receiving less than the minimum.

UAW: Canadian Auto Strike Over

The short-lived strike at General Motors' Canadian units ended last week, with the UAW getting a package some sources believe is fatter than that won by their U. S. counterparts.

The three-year contract covers workers at GM of Canada, Ltd.; General Motors Diesel, Ltd.; Frigidaire Products of Canada, Ltd., and McKinnon Industries, Ltd.—all GM wholly-owned subsidiaries.

The big point of issue was pensions, principally because government pensions in Canada are lower than in the U. S. The union sought to obtain a larger company contribution to make up for this difference.

The new pension plan provides $2.80 a month for each year of service plus a new supplementary benefit, payable until age 70, for all workers retiring at age 65 or over of $1.80 a month for each year of service up to $55.

Annual wage increases of 6 cents per hour or 2.5 pct, whichever is greater, were also agreed on. In addition, SUB and other fringes were increased.

High Court Reviews Labor Law Conflict

The U. S. Supreme Court may resolve a conflict between two laws on powers of Federal courts in labor dispute cases.

The high court will review a case in which a lower court refused to enjoin a union's violation of a no-strike labor contract with a company. The lower court refused because of the conflict between the Norris-LaGuardia Act and the Taft-Hartley Act.

While the Taft-Hartley Act gives the courts authority to enforce collective bargaining agreements, the Norris-LaGuardia Act forbids Federal courts to issue injunctions in labor disputes.

AFL-CIO: Is Split Healed?

Will the AFL-CIO compromise on settlement of job rights disputes heal the breach that threatened to split the giant labor organization?

Among the militant ranks of the CIO, which demanded some kind of an agreement to settle disputes, the word was they were satisfied. At least to the union men meeting in Miami Beach last week, a serious break was avoided.

In brief, the agreement was designed to protect unions from losing jobs to other unions. Specifically, it should prevent companies from farming out work such as maintenance which was formerly done by inside workmen.

The CIO had implied a permanent break if procedures were not adopted over a job rights plan. The plan, agreed to by unanimous vote of the Executive Council, also provides for means to settle these disputes. This had been demanded by the CIO's Walter Reuther.

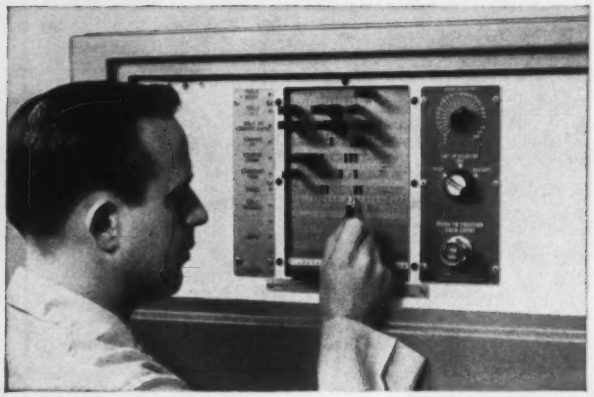
With the problem out of the way, for at least a time, the union convention re-elected George Meany president for another two years. It also approved a two-cents-a-month increase in federation dues. This will raise nearly $3 million a year, which the AFL-CIO apparently needs to meet operating expenses.

In the job rights agreement, a union can keep work it does now. No other union can seek work habitually done at a specific plant or job site by another union.

In the past, CIO locals had protested companies farming out maintenance or similar work to a company employing a craft union. This situation had reached such proportions it threatened to split the entire federation.

It was clearly a victory for Mr. Reuther's forces, who have plugged consistently for more centralized authority in the giant federation. Mr. Meany, who headed the AFL, tended to a more decentralized organization.

But, when it became apparent that a serious split would hurt the entire labor movement, the compromise, which nevertheless favored the CIO forces, appeared inevitable.



He's programming an automatic cycle

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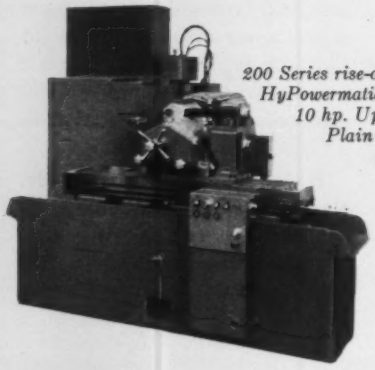

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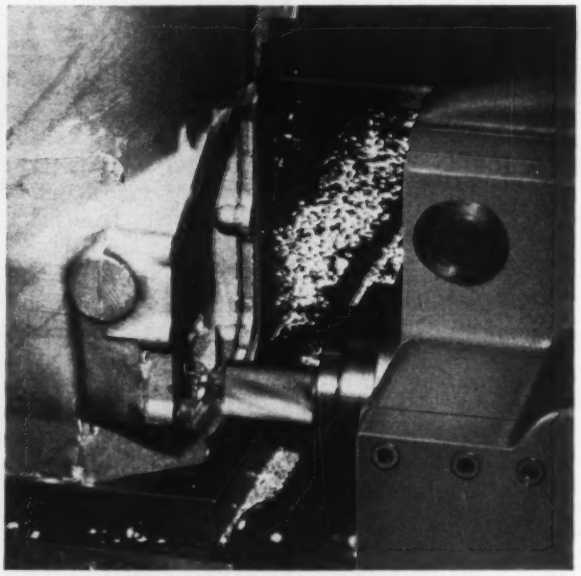

See what you can do with Telematic Control

Part: Aluminum gear case. *Operations:* Mill cover face, and two scallops on lower level—19 separate events in the Telematic cycle. *Machine:* CINCINNATI HyPowermatic equipped with Telematic Control. *RPM*—2000; *Feed*—19 ipm; *Depth of cut*—⅛″; *Time per piece*—2.47 min.

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The Federal Trade Commission now has almost free access to production and sales records of almost every big corporation in the United States.

The access was provided by the U. S. Supreme Court's decision that the FTC, in antitrust investigations, may obtain from business concerns the "confidential" reports prepared for the U. S. manufacturing census.

There is no recourse for businesses. They are required by law to file reports on production and sales with the Census Bureau. And though the Census Bureau cannot divulge this information, the FTC now has the right to get a copy of the report directly from the reporting company. Refusal of the FTC order could mean a $100 a day fine.

Six of the nine Supreme Court Justices agreed that The Census Act, which restricts the use of the reports, does not make the information secret. Copies outside of the Census Bureau, the majority said, do not have legal immunity. The FTC, the majority opinion said, can require the company "to supply the identical information from its files."

The minority view of the high court was that the government had gone back on its word by allowing the FTC to get reports the Census Bureau obtains as "confidential." The Census Bureau, backed by the Bureau of the Budget, supported this view.

But antitrust agencies pressed for a high court ruling. The FTC, supported by the Justice Dept., argued that the "confidential" plea jeopardized enforcement of antitrust laws. By winning their argument, they now can demand the information merely on suspicion that a company may be violating the antitrust laws.

The FTC says the ruling will be very helpful in prosecuting price-fixing and merger cases and in enforcing compliance orders. The census information will simplify investigations. FTC spokesmen say most companies had supplied the information voluntarily in the past, but some companies had balked.

■ IRS Decision Aids Trade Associations

Some of the heat has been taken off national trade associations which engage in lobbying activities.

The Internal Revenue Service has decided that a group operated primarily for promoting a common business interest is exempt from taxes even though its principal activity is influencing legislation.

The IRS originally held that a group engaging in substantial lobbying activities would not be exempt from taxes.

The new ruling does not change the IRS policy on trade association dues. A member firm still can only deduct that part of its dues used for activities other than lobbying. Trade associations have been fighting for a bill by Rep. Hale Boggs, D., La., to make all such dues deductible.

■ Loan Ceiling Set At $200,000 by SBA

The Small Business Administration has put a ceiling on loans to small companies. The only small businesses who can buck the ceiling are those in defense production.

The SBA set the maximum size of the loans it now will consider at $200,000. Higher loans may now be considered only for "defense oriented industries," says SBA Administrator John E. Horne.

■ Congress to Ratify President's Silver Plan

Congress is expected to give quick action to the second half of President Kennedy's plan to restore a free market in silver.

While the President was able to order the Treasury Dept. to stop selling silver to users, Congress must repeal the Silver Purchase Act of 1946 in order to remove the government's obligation to buy silver whenever it is offered for sale.

Repeal of the act seems assured, and most experts feel the move will restore price stability to the market. Shortly after President Kennedy announced the government would no longer sell silver, prices shot up.

Western mining interests will raise some objections to the repeal of the Purchase Act, although they happily backed the stop order on sales. Users, mostly in Eastern States, are unhappy over the stop order, but they will welcome repeal.

■ Federal Subsidies Planned for Shelters

A government-backed shelter construction program is slowly becoming a reality. The action could be a boon to the already growing construction work going into fallout shelters from private sources.

The Administration will ask Congress next month for a $700 million civil defense program that includes funds for subsidizing construction of community shelters in schools and hospitals. More than half the Civil Defense budget is expected to go to the shelter subsidy program.

Spotlights on standards...

the four American Presidents, carved out of the mountainsides, set standards which contemporary "public servants" might well emulate. This scene is particularly awe-inspiring at dusk, spotlighted by Crouse-Hinds, manufacturers of industry's standards in special purpose lighting, explosion-proof electrical equipment enclosures, traffic control equipment, and world-famous condulets.

30 YEAR OLD MEAKER "AUTOMATIC" PLATES 65-70 TONS OF PRODUCTS EVERY EIGHT HOURS AT CROUSE-HINDS CO.

In operation for over 30 years, the MEAKER AUTOMATIC at Crouse-Hinds, Syracuse, New York, turns out 65-70 tons of zinc plated condulets every eight hours. What's more, no down time has been recorded in all these years as the fault of the machine.

Reports Mr. Floyd Quinn, Plating Foreman: "Our MEAKER was installed in 1929 to handle condulets up to ¾" diameter. We have been processing from ⅜" *up to 6" diameters for years*, with no modification to the equipment." That's versatility!

No wonder Mr. Quinn adds: "If we were to install another automatic plater tomorrow, we'd insist on a MEAKER with little change from the one we have."

MEAKER has been building automatic processing equipment for continuous or batch type metal finishing since 1899 . . . from "compact-a-matic" units occupying minimum floor space and for limited production requirements—to the world's largest automatic plating installation which occupies over 180,000 square feet and produces 4½ acres of plated surface every 16 hours.

Our catalog "WHEN TO AUTOMATE" will give you some valuable ideas for improving profits through automatic plating or metal finishing

SINCE MEAKER 1899

THE MEAKER COMPANY

SUBSIDIARY OF SEL-REX CORPORATION

Nutley 10, New Jersey

Factories and offices Chicago 50, Ill., Los Angeles, Cal. and Nutley 10, N. J.

Steelmaking Slump Continues Abroad

Steelmakers in England and West Germany face a bleak common outlook: A recession that could last until the third quarter of 1962.

Realistic observers in England now feel that the recession will not end in the spring, as many had hoped. The industry cannot expect a resurgence of activity until the third quarter, at the earliest.

British strip mills are busy. Demand for sheet steel and tinplate is up. But in most other areas, orders have dwindled. Heavy mills, particularly plates, are suffering growing pains.

West German steelmakers will likely have to cut output by 15 to 20 pct this winter. Order flow improvement is not expected until the second quarter of 1962 at least.

Since the first of the year, order flow has lagged well behind capacity in West Germany. Monthly average of orders for the third quarter of 1961 was 1.4 million tons, compared with 1.68 million tons for the whole of 1960.

In both countries, inventories are a major factor in the slowdown. Many fear steel users may be switching to a permanently lower rate of stockpiling, a trend that would clearly delay recovery.

U. S. Exports, Imports Both Move Higher

U. S. exports made unexpected gains in October. But imports also increased.

Excluding military shipments, October's export total was $1.816 billion. This is 17 pct ahead of September's total of $1.557 billion, and higher than October, 1960, when exports totaled $1.707 billion.

Imports climbed from $1.2 billion in September to more than $1.3 billion in October. This was the highest level since July.

Officials will watch trade figures closely. Exports could drop, now that the domestic market is improving, while imports continue to rise. This would spell new weakness for the dollar in world markets.

For the 10-month period of 1961, exports were at an annual rate of $20.072 billion. This is 3 pct ahead of the 1960 pace of $19.412 billion for the same period.

Egyptian Pipeline Nearly Completed

Phoenix Rheinrohr Corp., leading West German steel and pipe producer, is completing its huge pipeline project in Egypt. The network will open the Nile Delta and pave the way for growing Egyptian industrialization.

Missiles for Italy

Vitroselenia of Italy has received a $15 million contract to design and manage installation of a missile test range on the island of Sardinia. It will serve present missile needs of the Italian Air Force and ultimate NATO programs. Vitroselenia is owned jointly by Vitro Corp. of America, and Selenia, S.p.A., a Raytheon Co. subsidiary.

Rambler Rolls Into European Market

American Motors Corp. will invade the European market in 1962. Ramblers will roll from assembly lines in Belgium.

Renault of France has agreed to turn out the Rambler models at its Brussels plant. Major components will be shipped from the U. S., to be assembled by Renault.

AM president George Romney says the Rambler sales target is 10 pct of its price class in Europe. Production will begin in January, limited to Rambler Classics at first.

Mill Exports Slide But Stainless Gains

Steel exports from the U. S. continue to drop. But exports of stainless and heat-resistant products are rising.

In the first 9 months of this year, stainless steel exports totaled 33,000 tons, valued at $34.4 million. In the same period, other steel exports were declining at a greater rate.

Principal stainless steel products exported this year include cold-rolled and hot-rolled strip, and cold-rolled and hot-rolled sheets.

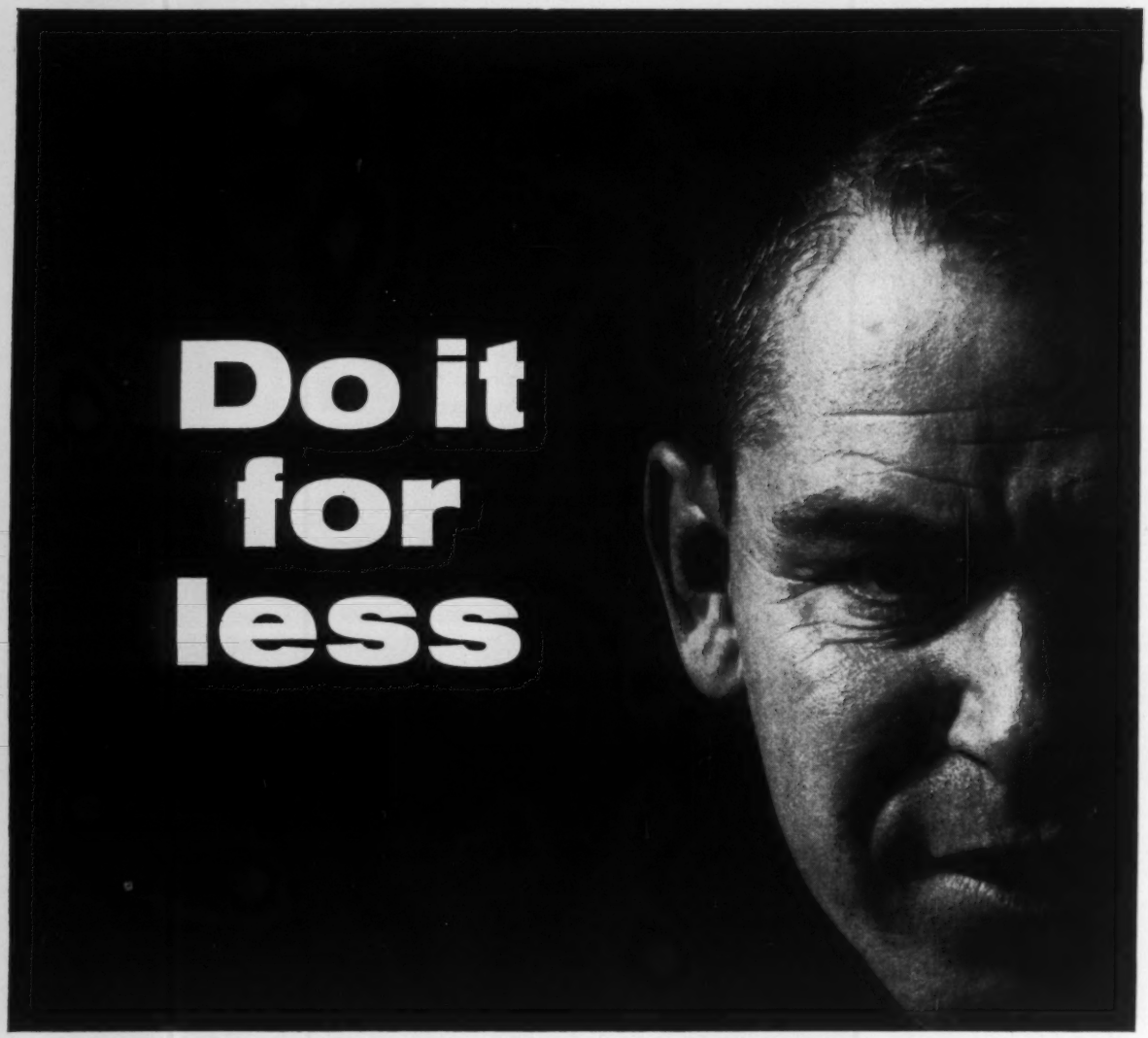
Canada and Sweden are now the leading foreign markets. Sales to Canada totaled 6000 tons in the first nine months, valued at $7.4 million. Exports to Sweden totaled 8000 tons, valued at $5.2 million.

Meanwhile, stainless steel production is growing abroad.

England and Japan will boost stainless output next year. And three U. S. companies are investing in Belgian and Italian plants.

A Canadian company, Atlas Steels, Ltd., is building a $40 million plant in Quebec, with annual capacity of 24,000 tons.

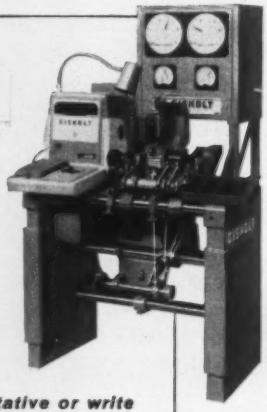
This foreign buildup could cut U. S. stainless export gains.



ON A GISHOLT BALANCER

Gisholt MASTERLINE 1S Balancer

Shown with separate unbalance location (angle) and amount meters for each correction plane.
Readings hold until corrections are made.
Complete plane separation.
Needs no special foundation.
Correction planes can be inside or outside work supports.
New HS line handles miniature, high-speed parts—impellers, armatures, gyros, self-driven assemblies.



Contact your Gisholt Representative or write for Catalog 1109D.

How long since you analyzed your balancing methods in light of recent developments?

One year? Two years? Take a fresh look. If you still rely on operator skill or judgment, accuracy suffers, time is lost, reject rates or field failures are high.

With Gisholt balancers, guesswork is eliminated. You can locate, measure, correct and inspect in *one handling*.

Only Gisholt offers all the advantages you need to do it for less.

GISHOLT
MACHINE COMPANY
Madison 10, Wisconsin, U.S.A.

Turret Lathes • Automatic Lathes • Balancers • Superfinishers • Threading Lathes • Factory-Rebuilt Machines with New-Machine Guarantee

Upgrades Bessemer Steel

Oxygen and steam are being applied to bessemer converters by Wheeling Steel Corp. Last week, Wheeling activated its bessemer vessels at Mingo Junction, O. By using the oxygen-vapor process instead of blowing with air, low-nitrogen steel can be produced. According to a company spokesman: "Our former bessemer steel could only be used for pipe and roofing. But steel made by the new process suits a variety of products."

Thermosetting Auto Enamel

To buff, or not to buff? That's the poser automakers always face when they're forced to choose between lacquer and enamel finishes. But the development of a new thermosetting acrylic auto enamel will let them beg the question. According to Pittsburgh Plate Glass Co., this enamel can be buffed and polished after baking.

The Bearing "Gap"

Military services are going to need bearings that will function well beyond present high-temp limitations, according to a survey made by the National Academy of Sciences. Present state-of-the art in bearing development falls far short of the goal. One reason for this lag is the fact that there are no commercial materials specifically developed for bearing uses above 1000°F. An immediate objective is to achieve bearing operation in the —450° to 3000°F temperature range and a bearing pressure range from 0-1000 psi.

Welds for Fiber Metals

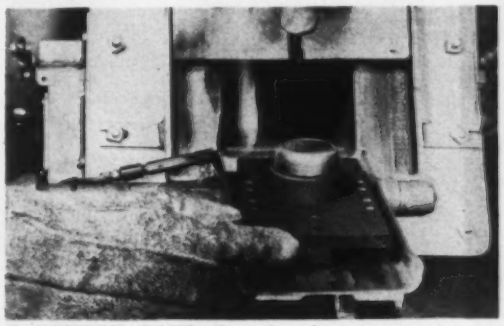
Fiber-metal resistance welding is gaining favor as a method for fabricating parts of exotic metals and alloys. Fiber metallurgy produces materials that may be varied in density and thickness. Even heterogeneous metallic fibers are possible. Welding by conventional resistance techniques will allow production of diverse piece-part shapes.

Gas-Turbine Improvements

Small gas turbines are chalking up startling performance gains. Power-to-weight ratios now exceed those of gasoline engines. And there's no penalty in fuel consumption. However, these units are still too large for passenger-car use.

Sapphire-to-Metal Seals

New sapphire-to-metal seals look like a good bet for windows subject to vacuum and/or extreme temperatures. Sapphire is an efficient transmitter of light from the near infrared to the far ultraviolet. With a maximum leak rate of 10^{-9} cc



SAPPHIRE DISK: Gets brazing treatment.

He per second, the seals remain hermetic even after repeated bake-outs at temperatures as high as 800°. After the sapphire disks are metallized, they're furnace brazed to a metal component.

Curbs Vanadium Oxidation

Vanadium alloys have good hot strength. But despite continuing research during the last ten years, little progress has been made toward overcoming this steel's critical shortcoming—poor oxidation resistance. Now, however, Air Force researchers lend cautious support to the belief that alloying vanadium with certain other metals and/or oxide coatings improves oxidation resistance. Promising alloys are: 50V-40Ti-5Al-5Cr, 59V-30Ti-5Al-5Cr-1Si and 50V-41Ti-2Al-7Ni.

Superior Piezoelectric?

Like some naturally piezoelectric crystals, lead zirconite-titanate generates electricity when it's squeezed. It also changes shape when subjected to electrical stress. But unlike natural crystals or conventional piezoelectric synthetics, this material stands up to high temperatures and pressures. High conversion efficiency is another advantage.

Check these reasons why Ohio Drawn-Welded is your best buy

✓ OHIO is your most complete source for drawn-welded tubing—from ⅜" to 7¼" OD, from .028 to .344 wall thickness.

✓ OHIO has the most modern welded tube mills in operation today, backed up with 25 years of experience in the production of quality welded steel tubing.

✓ OHIO DRAWN-WELDED is a guaranteed product of Ohio Seamless Tube, SHELBY, OHIO, U. S. A., capital of steel tube production since 1890.

✓ At OHIO, welded and seamless tube production is *integrated*. The same practices, craftsmanship and facilities are employed to complete the processing of drawn-welded as we use on our seamless product, which is world-famous for its reliability.

✓ Check OHIO DRAWN-WELDED on your next tubing order for economy, dimensional accuracy, super finish, strength. You'll see why it's the best buy. A-3187A

Representatives in principal cities. Check: THOMAS', MacRAE'S, CONOVER-MAST, FRASER'S, SWEET'S FILE.

OHIO

OHIO SEAMLESS TUBE

Division of Copperweld Steel Company

SHELBY • OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging

Foundry Problem

Sir—I have just finished reading your timely report on the foundry price squeeze ("Foundry Profit Down; Pinch On," IA, Dec. 7).

This report covers the subject so thoroughly and with such clarity that I would be most grateful if I could receive reprints as soon as possible.

You are to be commended for highlighting a condition that is only too familiar to us in the foundry industry.—Nicholas G. Fanos, executive vice president and general manager, Frederick Iron & Steel, Inc., Frederick, Md.

Trade With Tito

Sir—You have done it again. The Nov. 30 article, "Should the West Trade With Tito?" is good for thought. Please send us reprints of this article and the sequel, "Yugoslavia's Industrial Plans Outrun Financial Growth" (IA, Dec. 7).—Charles Uhden, Spokane, Wash.

Planned Economy

Sir—Your editorial, "A Planned Economy Is Not a Free Economy!" (IA, Oct. 19) is one of the best I have ever read. I cannot help but express my personal admiration for your thinking as well as your expression of those thoughts. I hope that your publisher or other interested groups achieve the kind of distribution of your editorial comments they so well deserve. They should be dispatched to some of our "planners" who need to read a little common sense for a change.—W. R. Gilliland, Pittsburgh, Pa.

Open-Coil Process

Sir—You did an excellent job on the cover story (Open-Coil Process Makes Bid for Stainless Market, IA, Oct. 19) and it has been extremely helpful to us in many ways.

I am amazed at the wide coverage your publication has. We have received inquiries from steel producers from all over and are negotiating very actively with Japan especially.

Thanks again for the fine job.—A. J. Seiler, president, Alloy Surfaces Co., Inc., Wilmington, Del.

Trade Policy

Sir—We have a question concerning the graph above Mr. R. W. Crosby's Special Report, (Should U. S. Liberalize Trade? Congress Braces for Battle, IA, Dec. 7). We would like to know where the information for the graph was obtained and, specifically, what was included in the term "finished manufactures" as used in the graph.

Mr. Barnhard and the writer found the article very well written as far as it went. We feel that Mr. Crosby could and would have said much more, space permitting. We will be looking forward to Mr. Crosby's reports on this subject during the coming months.—Leonard S. Sattler, William J. Barnhard law offices, Washington, D. C.

■ **Source of the graph is the U. S. Dept. of Commerce. Its publication, "Business Statistics, 1961 Edition," gives detailed source information.—Ed.**

"This briefcase is for persistent salesmen. It unfolds into a cot."

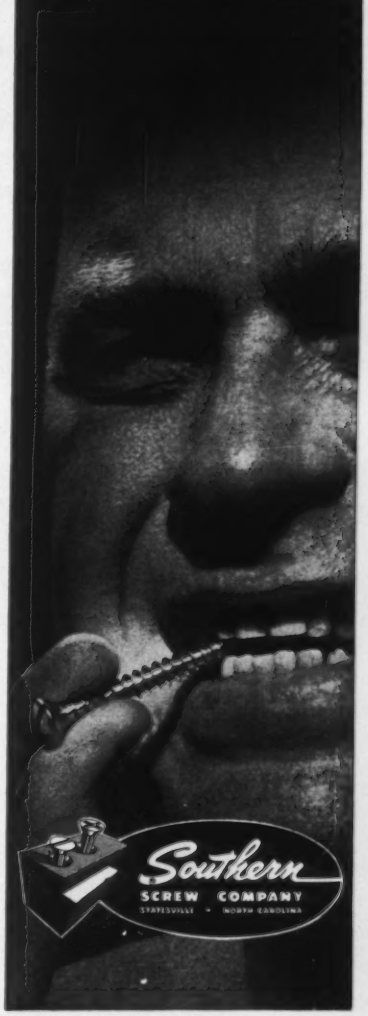
YOU CAN "PUT THE BITE" ON Southern

Southern fasteners would pass the old-time "bite" test for quality without a doubt. They'll stand any test for quality because they are made by USA specialists using USA materials.

You can "put the bite" on Southern for service, too. Contact your Southern distributor today, or write, wire or phone Southern Screw Company, P.O. Box 1360, Statesville, North Carolina. Phone TRiangle 3-7213.

Manufacturing and Main Stock in Statesville, North Carolina. Warehouses: New York • Chicago • Dallas • Los Angeles

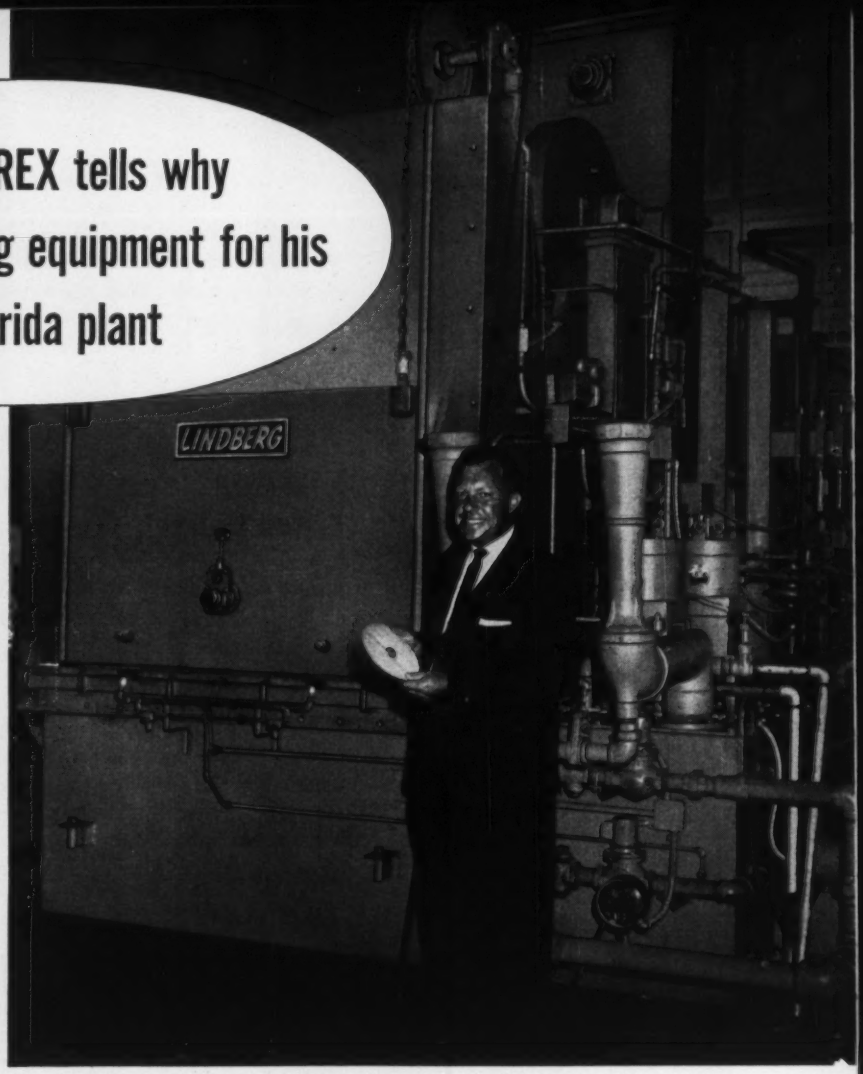
Machine Screws & Nuts • Tapping Screws • Stove Bolts • Drive Screws • Carriage Bolts • Continuous Threaded Studs • Wood Screws • Hanger Bolts • Dowel Screws



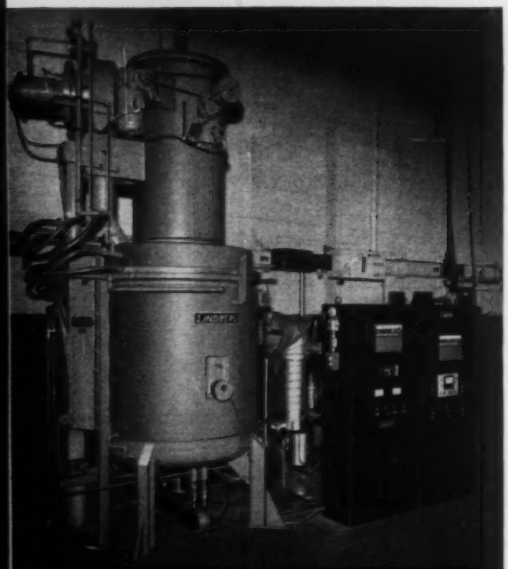
J. WALTER REX tells why he chose Lindberg equipment for his new Florida plant

QUOTE from Mr. Rex

"When we designed our new plant, Rex of Florida, Inc., we made sure we could provide the Florida metal working industry with complete heat treating services. After carefully surveying the industrial activities we would serve we knew we would be called upon to offer scientifically controlled, high quality heat treating for a variety of metals, both ferrous and non-ferrous, and an unusual diversity of sizes, shapes and weights. Our long experience with Lindberg furnaces and atmosphere controls assured us that we could depend on Lindberg equipment to help us meet most efficiently the widely varying demands of our Florida customers."



J. Walter Rex, President, Rex of Florida, Inc., Fort Lauderdale, with Lindberg high temperature, all-purpose furnace, one of six Lindberg units specified for this new plant. Mr. Rex, also President, J. W. Rex Company, Lansdale, Penna., is recognized as one of the foremost metal working authorities and his commercial heat treating operations are among the largest and most important in the country, particularly in treating components for rockets and missiles.



Latest Rex purchase from Lindberg—new vacuum furnace for Lansdale, Penna., plant

Mr. Rex's confidence in the ability of Lindberg equipment to meet the most exacting commercial heat treating requirements is based on the years of efficient and dependable service rendered by Lindberg units in his commercial heat treating operations. He has been a Lindberg customer for nearly 20 years. We're glad that he has found our equipment so satisfactory. We're very well satisfied with Mr. Rex as a customer, too. Altogether, including the units for Rex of Florida, Inc., he has purchased 34 Lindberg units over the years.

Lindberg offers the most complete line of fuel-fired and electric furnaces and equipment for heat treating ferrous and non-ferrous metals available to industry. If you have any problem in heat treating, get your local Lindberg representative's help now. You can depend on his experience and Lindberg's engineering and design know-how to provide exactly the right equipment for your need. And it's easy, too! Just call your Lindberg Field Engineer (he's listed in your classified phone book) or write us direct. Heat Treating Furnace Division, Lindberg Engineering Company, 2452 West Hubbard Street, Chicago 12, Illinois.

Los Angeles plant: 11937 S. Regentview Avenue, Downey, California. In Canada: Birlefco-Lindberg Ltd., 15 Pelham Ave., Toronto 9, Ont. Also, Lindberg plants in Argentina, Australia, England, France, Italy, Japan, Spain, Switzerland and West Germany.

LINDBERG

heat for industry

The Vital Issues

With a new Administration in office this year, business more than ever needed a close ear to the goings on in Washington.

Uppermost in management thinking was how the Kennedy forces would react to the many problems shared by industry and government.

New Series—To find out what the Administration's approach to these problems would be, The Iron Age embarked on a new series of interviews with high-level government officials soon after the new Administration got underway.

Called the Vital Issues Facing Management, its purpose is to obtain first-hand information from government administrators directly concerned with these vital issues.

This week Treasury Secretary Douglas Dillon speaks out on one of metalworking's long-time problems—depreciation reform.

For many years, metalworking executives have sought more liberal depreciation laws to modernize the nation's industrial plant.

Administration's Program — The Kennedy Administration has proposed a dual approach to combat the growing obsolescence of the nation's industrial plant. It plans to shorten the useful lives used for depreciating equipment for tax purposes. And its investment credit plan offers business new incentives to buy new equipment.

So far, the reaction from businessmen has been mixed. But there are signs that more industry groups and management executives are looking more favorably upon the Administration's plan than they did at first.

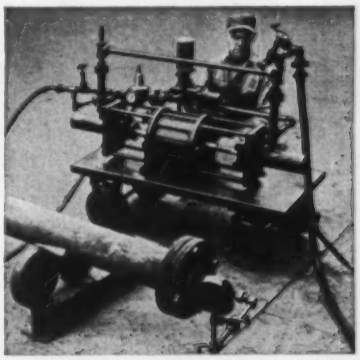
In this exclusive interview Treasury Secretary Dillon tells why this is. He goes into detail on the ins and outs of depreciation reform, the timing, and the final shape he believes it will take.

Other Problems—He also talks about other business tax problems such as foreign income, lobbying expenses, capital gains and the chances for overall tax reform in the next session of Congress.

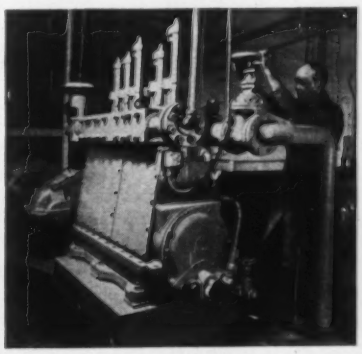
In the coming year, we expect to have more interviews with government and industry people involved in the vital issues facing management.

DILLON SPEAKS OUT: Treasury Secretary Douglas Dillon discusses depreciation and other tax issues with Iron Age Washington Editor R. W. Crosby (left) and E. C. Beaudet, Iron Age Managing Editor (center).

Need a pump as tough as these?



A familiar sight at one plant is this Aldrich Hydraulic Pump. It's been given plenty of work to do pressure testing process equipment . . . pipe, heat exchangers, tanks, coils, special pressure vessels from 300 to 7330 psi. To get it from one of a dozen tasks to another, quickly, maintenance men have mounted the pump on a portable rig. The company reports that with this Aldrich Pump, equipment testing is faster, more efficient than before.



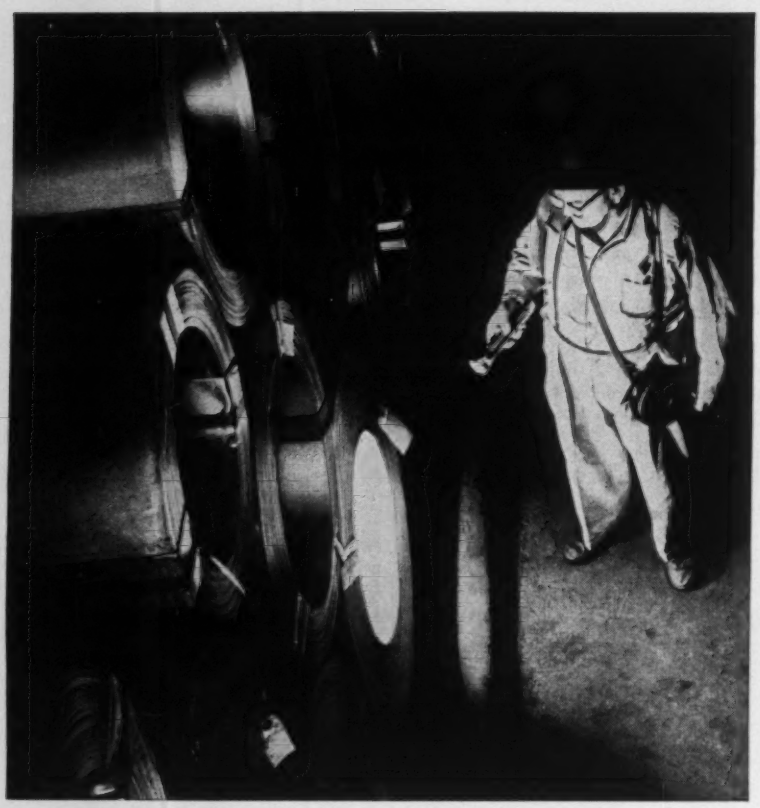
Two Aldrich reciprocating pumps lead a busy life here, keeping hydraulic presses on-line three shifts a day. For this molding and extrusion operation, pressures must be—and are—maintained at a steady, high level. The penalty for any deviation is up-and-down quality, soaring reject rate. This is rugged duty, but no unscheduled downtime has ever occurred since the pump was installed.

For pumps of 5 to 2500 hp, pressures to 50,000 psi, write Aldrich Pump Co., 8 Pine St., Allentown, Pa. You'll get a pump as tough as these because...

THE TOUGH PUMPING PROBLEMS GO TO

ALDRICH

SUBSIDIARY OF INGERSOLL-RAND



2 A.M....
but cost of possession never sleeps

The most dormant looking thing in the world is a pile of steel in storage . . . yet it is as active as a bucket of worms!

Your money is tied up . . . and costs go merrily on. High local taxes. Scrap losses from inefficient utilization of obsolete sizes or gauges of steel in inventory. Capital pinned-down by steel inventory could better be at work as income-earning investment.

Here's an ideal solution for most steel users . . .

Use the complete stocks of your nearby steel service center just as if they were your very own. Convenience and availability are augmented by other economies. Plus, of course, the variety of first-step processing services which many centers are tooled-up to provide.

To help your production and cost accounting people in figuring the true cost of steel stocks, ask your steel service center salesman for the booklet, *What's Your Real Cost of Possession for Steel?* Or write to Steel Service Center Institute.

COST OF POSSESSION . . . *to determine your own cost of possession for steel in inventory, consider all these factors:*

Cost of capital: inventory, space, equipment — Cost of operation: space, material handling, cutting and burning, scrap and wastage — Other costs: obsolescence, insurance, taxes, accounting.

YOUR STEEL SERVICE CENTER

STEEL SERVICE CENTER INSTITUTE

540-D Terminal Tower • Cleveland 13, Ohio

COMING EXHIBITS

Plant Engineering & Maintenance Show — Jan. 22-25, Convention Hall, Philadelphia.

Electrical Engineering Show—Jan. 29-Feb. 2, New York Coliseum.

MEETINGS

JANUARY

Reliability and Quality Control—Eighth national meeting, Jan. 9-11, Statler Hilton Hotel, Washington, D. C.

National Barrel & Drum Assn.—Annual meeting, Jan. 11-13, Americana Hotel, Miami Beach, Fla. Assn. headquarters, 1343 L St., N. W., Washington, D. C.

Institute of Scrap Iron & Steel—Annual convention, Jan. 14-17, Statler-Hilton Hotel, Washington. Institute headquarters, 1729 H St., N. W., Washington.

Assn. of Consulting Management Engineers, Inc. — Annual business meeting, Jan. 15, University Club, New York. Assn. headquarters, 347 Madison Ave., New York.

Mining Symposium—University of Minnesota and Minnesota Section, AIME, joint meeting, Jan. 15-17, Duluth Hotel, Duluth, Minn.

Compressed Gas Assn. — Annual meeting, Jan. 15-17, Waldorf-Astoria Hotel, New York. Assn. headquarters, 500 Fifth Ave., New York.

Steel Plate Fabricators Assn.—Annual meeting, Jan. 15-19, Mountain Shadows Hotel, Scottsdale, Ariz. Assn. headquarters, 105 W. Madison St., Chicago.

Industrial Heating Equipment Assn., Inc.—Winter meeting, Jan. 22-23, The Drake Hotel, Chicago. Assn. headquarters, 2000 K St., N. W., Washington, D. C.

Aluminum Assn.—Annual meeting, Jan. 24-26, New York. Assn. headquarters, 420 Lexington Ave., N. Y.

MEETINGS

American Sprocket Chain Manufacturers Assn.—Annual meeting, Jan. 25-26, Drake Hotel, Chicago. Assn. headquarters, 819 South Aldine Ave., Park Ridge, Ill.

Truck Trailer Manufacturers Assn.—21st annual convention, Jan. 28-31, Palm Springs Riviera Hotel, Palm Springs, Calif. Assn. headquarters, 710 Albee Bldg., Washington.

Associated Equipment Distributors—43rd annual meeting, Jan. 28-Feb. 1, Hilton Hotel, Chicago.

Society of Plastics Engineers, Inc.—Annual technical conference, Jan. 30-Feb. 2, Penn-Sheraton Hotel, Pittsburgh. Institute headquarters, 65 Prospect St., Stamford, Conn.

Midwest Welding Conference—8th annual, Jan. 31-Feb. 1, Technology Center, Illinois Institute of Technology, Chicago, Ill. Institute headquarters, 35 West 33rd St., Technology Center, Chicago.

FEBRUARY

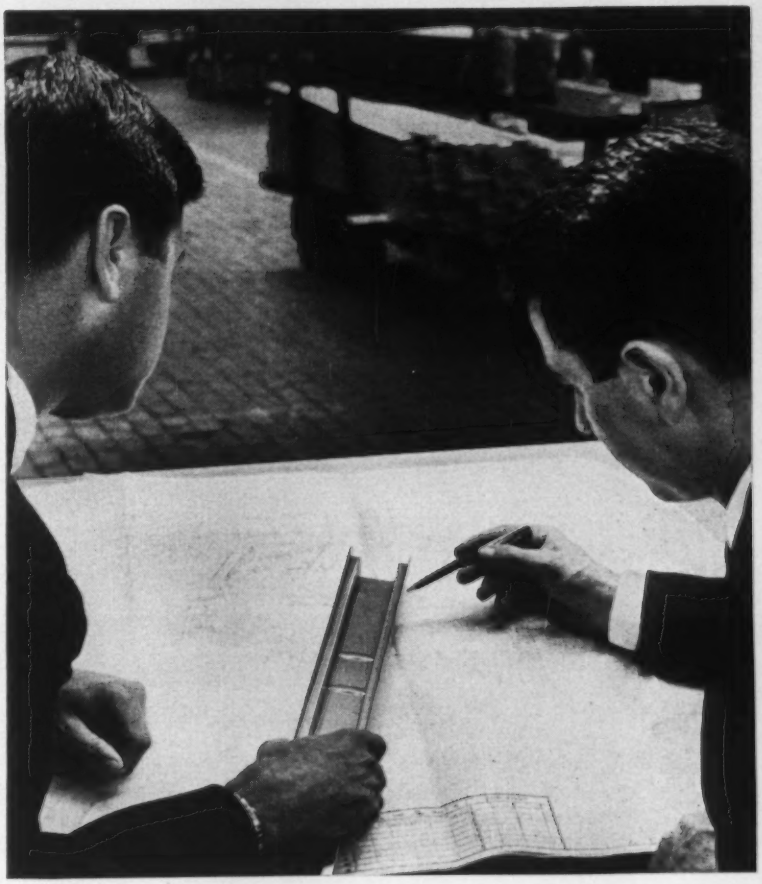
American Society for Testing Materials—Committee week, Feb. 5-9, Statler-Hilton Hotel, Dallas, Tex. Society headquarters, 1916 Race St., Philadelphia.

Materials Handling Institute, Inc.—Spring meeting, Feb. 6-7, Hilton Inn, Atlanta, Ga. Institute headquarters, One Gateway Center, Pittsburgh.

Industrial Truck Assn. — Spring meeting, Feb. 8, Hilton Inn, Atlanta. Assn. headquarters, One Gateway Center, Pittsburgh.

American Coke & Coal Chemical Institute—Eastern regional meeting, Feb. 8, Drake Hotel, Chicago. Institute headquarters, 711 Fourteenth St., N. W., Washington, D. C.

Hoist Manufacturers Assn., Inc.—Annual meeting, Feb. 13, Washington. Assn. headquarters, One Thomas Circle, Washington.



LOCAL TECHNICAL AID

Time-saving benefit offered by your steel service center

When you have problems of procurement, production, or steel selection, the salesman from your nearby steel service center is a good man to know. With his technical training and experience, he can help you save money, improve product, step-up production.

Because steel service centers are organized to deliver any size lot of virtually all forms and types of steel, you can try test runs and experimental tool settings quickly, economically.

Your steel service center is *customer-oriented*, in business to fill *your* needs . . . on selection, delivery, and on predelivery processing. He reduces your "cost of possession" of steel, too. Call him when you need steel or steel advice.

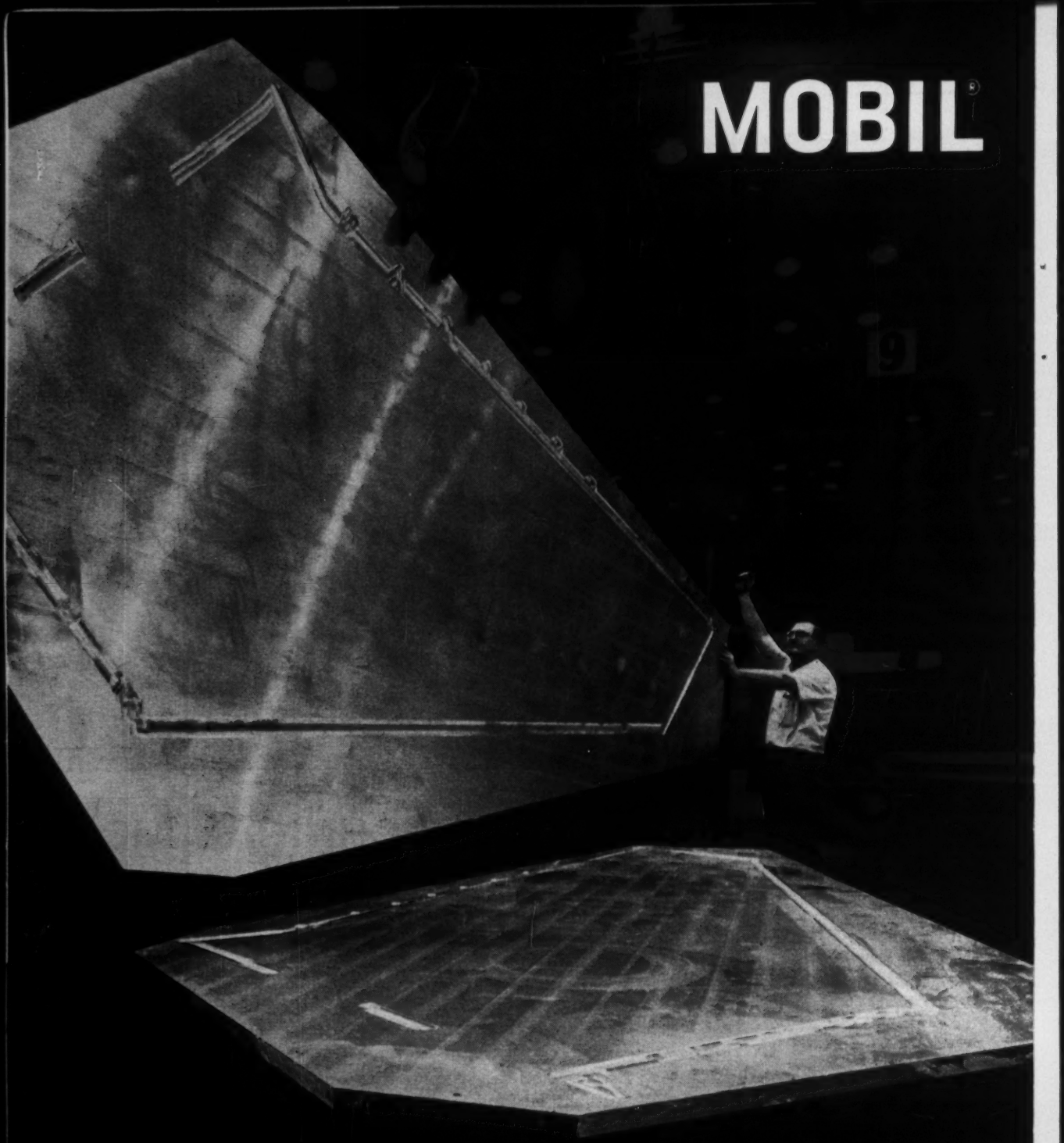
YOUR STEEL SERVICE CENTER

STEEL SERVICE CENTER INSTITUTE

Terminal Tower • Cleveland 13, Ohio

STEEL SERVICE CENTER INSTITUTE

Steel



$31,920 ANNUAL OUTLAY SAVED. Moving A3J wing sections from one machine to another is costly. Because stick-slip of the table limited milling machine No. 5 to rough cuts only, wing sections had to be moved to another machine for finishing. This would have cost $2,520 a year in labor and $14,700 a year for each machine in downtime. Mobil's recommendation of its Vactra No. 4 ended both the stick-slip and the change-over cost. Combined saving – $31,920.

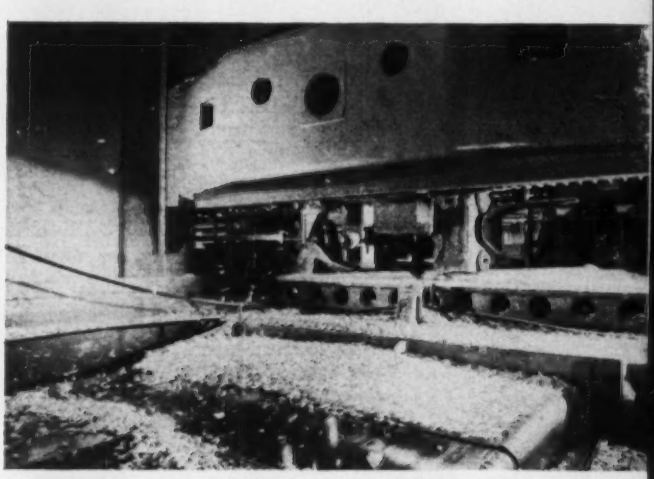
effects a projected $38,620 saving at North American Aviation

Mobil recommendation reduces cost of milling A3J Vigilante wing sections by eliminating stick-slip problem ... avoiding machine repair cost and reducing work handling.

The job: Skin milling aluminum alloy wing sections for Navy A3J Vigilante attack planes; designed, engineered and built by North American Aviation's Columbus (Ohio) Division—one of the nation's major defense facilities. Skin mills reduce thick aluminum alloy slabs to less than half their original thickness, leaving only structural ridges at original height. Finished contoured wing section becomes part of a "wet wing" designed to contain fuel.

The problem: Excessive stick-slip due to poor way lubrication made one mill too inaccurate for finishing cuts. Work had to be moved to another machine for finishing. Attempts to improve the situation by machine adjustment were unsuccessful.

The solution: Mobil introduced and recommended an improved Vactra® No. 4—a lubricating oil designed especially to meet the critical requirements of lubrication between plastic and cast iron ways. It completely eliminated the stick-slip problem. Now both rough and finish cuts can be made on the same machine, saving work handling and labor costs projected at $31,920 annually. A previous plan to remove the 40-foot table and rescrape the ways became unnecessary, avoiding a repair cost of $6,700. Total savings—$38,620.



$6,700 saved by eliminating scheduled 8-day repair job. Normally running six 24-hour days a week, each of NAA's skin mills has a production value of $800 a day. Eight days' downtime for repair on Mill No. 5 would have represented a loss of $6,400. Adding $300 in repair labor would have brought the total cost to $6,700, avoided by Mobil's lubrication recommendation.

VACTRA® NOS. 1-4

Meet All 6 Requirements for Effective Way Lubrication:

1. Minimum stick-slip for greater accuracy
2. Controlled "table float" for precision operation
3. Unsurpassed protection against way scoring
4. Prevention of filter clogging
5. Improved protection against rust and corrosion
6. Effective lubrication under simple re-use conditions

H. M. Lamb, Mobil Representative, inspects bed ways of one of North American's many skin mills. All ways are now protected with Vactra No. 4.

Mobil

MOBIL OIL COMPANY
150 East 42nd Street
New York 17, N. Y.

METALGRAMS

. . . news of "Electromet" ferroalloys and metals

UNION CARBIDE METALS

DECEMBER 1961

REDUCED INVENTORIES CUT COSTS -- Fast delivery of ferroalloys from one of Union Carbide Metals' 39 distribution centers allows metal producers to reduce inventory costs. Why? Large ferroalloy inventories are no longer needed. Purchases can be made to meet current ferroalloy needs. UCM has a plant or warehouse in every major metal-producing area in the country. Thus, delivery to your plant has been reduced from days to hours.

* * *

IMPROVED PACKAGING AND HANDLING, TOO -- Union Carbide Metals has also reduced customer handling costs by developing better packaging and material-handling methods. UCM introduced dump trucks for bulk deliveries of alloys. It has long used railroad container cars. Special shipping and unloading techniques have often been developed to meet a customer's particular conditions. UCM also played a leading role in the development of pre-formed alloys such as bricks, briquets, and pigs, and pre-weighed packages such as bags, cans, drums, and box pallets. For more information on distribution centers and alloy shipments, write for the article, "More Efficient Ferroalloy Distribution," in the Fall 1961 issue of UNION CARBIDE METALS REVIEW.

* * *

ARC OR INDUCTION -- WHICH IS BEST? -- In just a few years, vacuum-induction and vacuum-arc melting have grown from laboratory curiosities to important commercial processes. In fact, today they account for 280 million lb. of annual capacity in the United States. Although both are designed to produce ultra-pure metals and alloys, they are not strictly competitive. Vacuum-induction melting is the best method of making metals where tight control of chemical analysis is required. Vacuum-arc melting improves purity and uniformity by effectively removing gases and inclusions. For more information, write for the article, "Which Vacuum Process to Use?," in the Fall 1961 issue of UNION CARBIDE METALS REVIEW.

* * *

SELECT AN ALLOY -- Are you looking for a low-cost charge chrome alloy that will best fit your stainless steel melting conditions? Or an exothermic chromium or manganese that can be used for large open-hearth ladle additions? Or pure metals such as chromium, manganese, silicon, columbium, tantalum, and vanadium? You can find the answers in the new "Electromet" Ferroalloys and Metals Selector that contains a complete list of alloys for steel, iron, and nonferrous metals. It lists the composition and suggested use of each alloy...so you can select the one you need. For a copy, write for F-20,119.

* * *

UNION CARBIDE METALS COMPANY, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. In Canada: Union Carbide Canada Ltd., Toronto.

"Electromet" and "Union Carbide" are registered trade marks of Union Carbide Corporation.

STEEL MILLS ARE TALKING MORE CONSERVATIVELY about 1962 than most reports would indicate. The prevailing range is between 105 million and 109 million ingot tons. Only one major mill is predicting better than 110 million tons, according to an informed source. A spread of 110 to 115 million tons has been commonly mentioned in stories about 1962.

NEW PLANT AND EQUIPMENT SPENDING is expected to increase through the first quarter next year. This is noted in the latest survey of the Commerce Dept. and the Securities and Exchange Commission. First quarter capital spending is scheduled at a seasonally adjusted annual rate of $36.5 billion. This is 6 pct over this year's rate, and back to the 1960 Spring high.

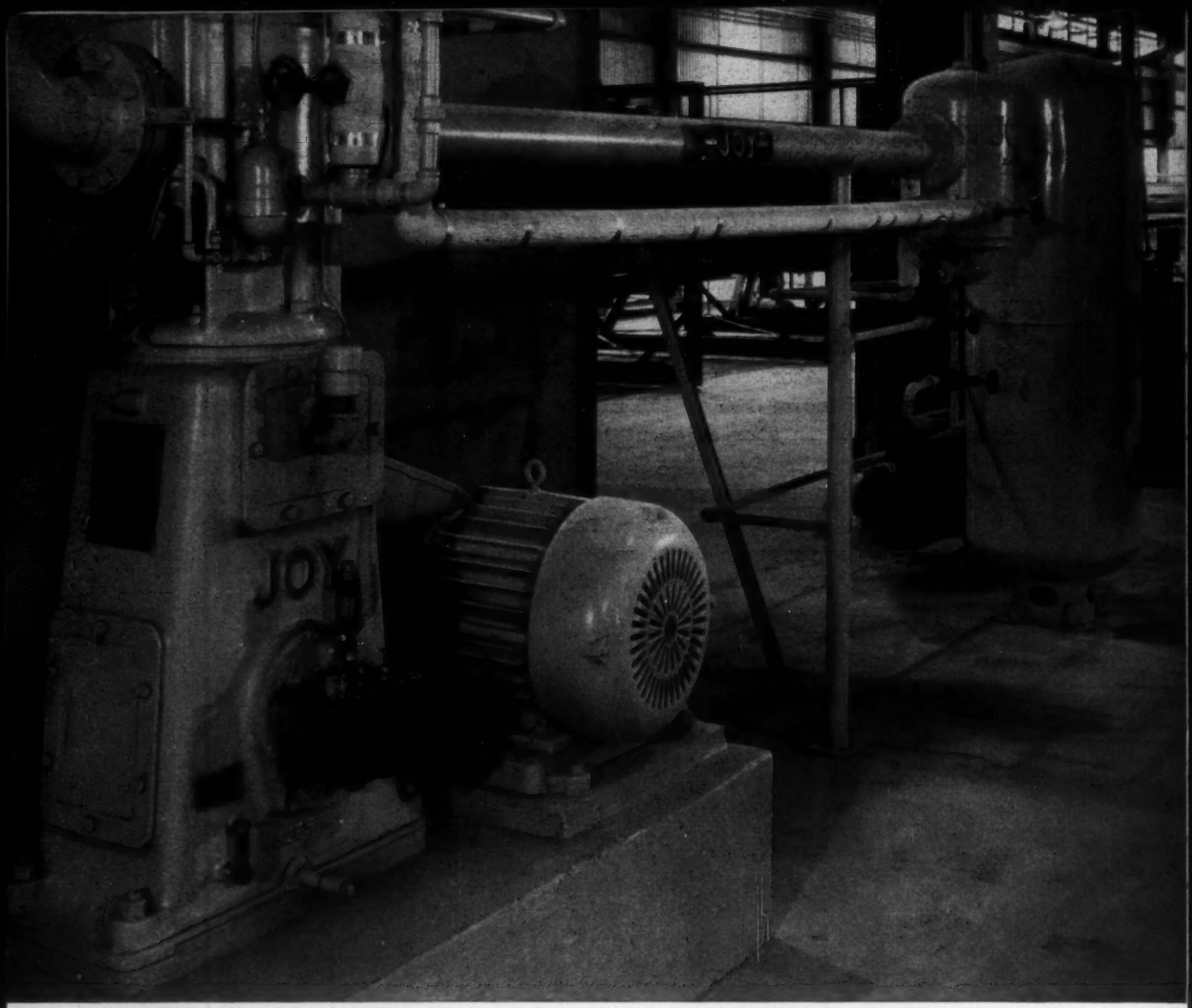
REFRACTORY METALS ARE MOVING TOWARD MARKETING MATURITY, says E. T. Collinsworth, Jr., president of Fansteel Metallurgical Corp. He says that refractory metals--metals that remain solid at temperatures up to 3600°--have "traversed from the specialty market to be now considered a commodity."

FARM EQUIPMENT BUILDERS are stepping up their forecast sights for 1962. Farm income has been running at a higher level than previously predicted. Now, tentative sales forecasts for 1962 are running as high as 5-10 pct above the 1961 sales level.

THE RESEARCH AND DEVELOPMENT BOOM is expected to account for $14 billion in outlays this year. Marketing men point out that R&D is now at the status of a major U. S. industry. The R&D outlay about equals the amount spent annually for advertising by U. S. business; and equals the dollar gross of the auto industry.

CAPITAL SPENDING BY RAILROADS is not indicated yet by railroad earnings. Rail earnings in October surpassed October 1960 by $18 million, according to the Assn. of American Railroads. However, yearly earnings still lag far behind 1959 and 1960.

A TREND TO YEAR-ROUND AIR CONDITIONING by home builders is giving a boost to makers of central air-conditioning. The Air-Conditioning and Refrigeration Institute reports that in 1961 about 50 pct of all unitary installations dollarwise will be in residences. This is almost a 20 pct jump since 1956.



Century motor powers air compressor around the clock . . . .

This 25-horsepower Century motor helps furnish compressed air vital to the manufacture of gypsum-derivative products. With the plant operating three shifts daily, a constant supply of compressed air is needed to sustain the manufacturing process.

Century motors are especially suited for compressor applications because of their capacity to take frequent on-off cycling. Their high starting torque activates the tightly enclosed compressor pistons almost instantaneously. The Century totally-enclosed-fan-cooled enclosure offsets the presence of abrasive dust in the plant.

The Century Electric combination of a complete motor line (over 10,000 types, from one-twentieth to 400 horsepower) and a national sales organization whose exclusive interest is in motors, assures you of getting the right motors for your needs. If you have a motor question, contact your nearby Century sales engineer or your authorized Century motor distributor.

CENTURY ELECTRIC COMPANY

St. Louis 3, Missouri *Offices and Stock Points in Principal Cities*

Century

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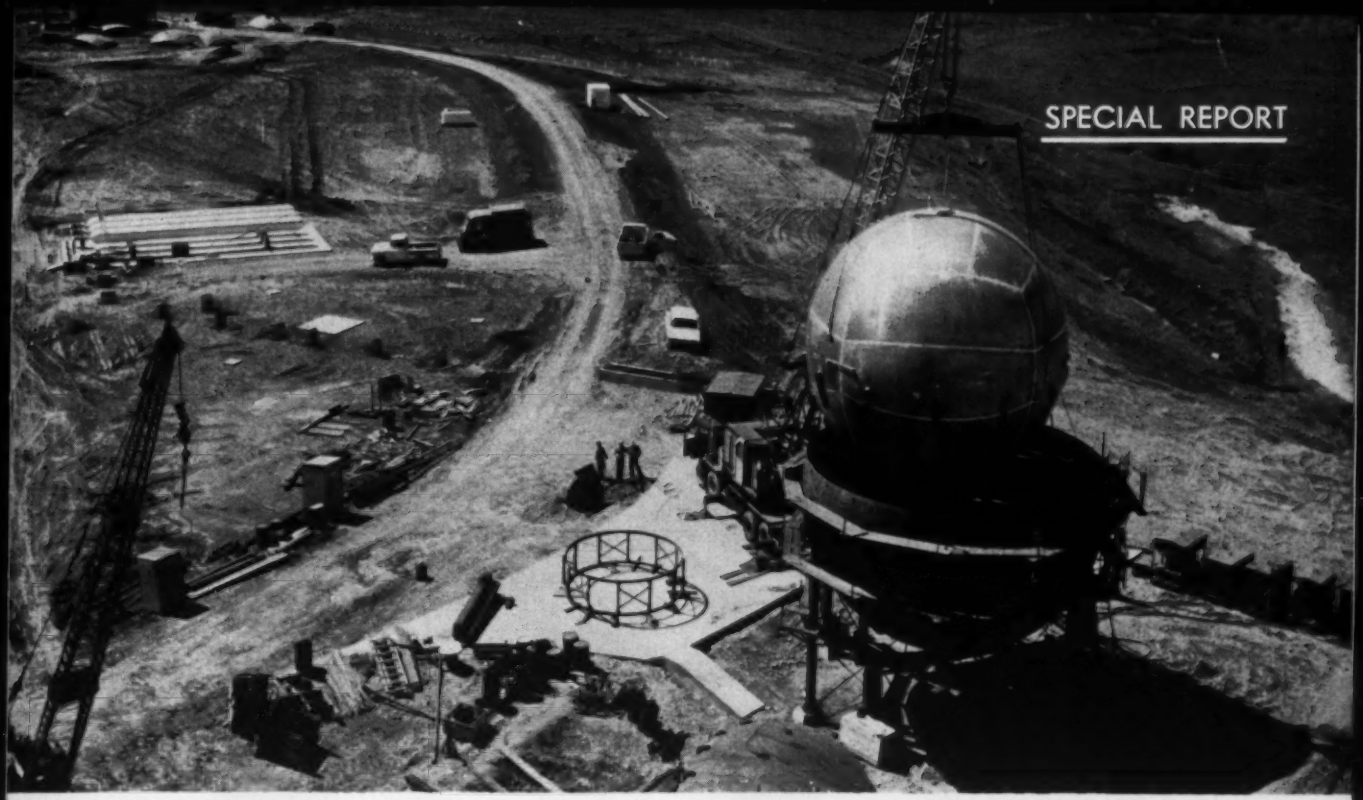


DOUBLE WALL SPHERE: A 90,000 gal cryogenic tank built by Chicago Bridge & Iron for Douglas Aircraft.

Metalworking Scrambles for Part Of Growing Cryogenics Market

By 1970 the market for low temperature storage tanks may be worth $1 billion annually.

Aluminum and stainless already have a toe-hold but more eyes are on 9 pct nickel.

By T. M. Rohan

■ Builders of low temperature storage tanks for liquefied gas—cryogenic tanks—are in the unusually fortunate position these days of having a rush for their products. Growth has been spectacular. The tanks are revolutionizing the entire gas distribution industry and opening up lower cost volume usage to hundreds of metalworking and other plants.

Behind the scenes a major marketing drive is raging between the critically important metals used—aluminum, stainless, and 9 pct nickel alloy steel. If 9 pct nickel could get through the barrier of manufacturing codes, it could break the present armlock on the market of aluminum and stainless by slashing materials costs in half. Millions of dollars are at stake.

The tanks themselves must be built to quality and vacuum standards exceeding boiler requirements with both pressure and vacuum combinations. They range in size from about 30 gal (and look much like a 40 gal home water heater) to several hundred thousand gallons.

Liquid Oxygen—The most spectacular use so far for the tanks is at missile launching sites and bases where liquid oxygen (LOX) for missiles is stored in huge double-walled tanks. These are so well insulated they hold the LOX at under its normal evaporation point of —297°F for months under a boiling sun with only nominal pressure and no leakage.

But the biggest, fastest-growing use is in industry where a 30-gal tank weighing 475 lb filled, holds as much cubic gas as a dozen high-pressure heavy steel cylinders totaling 2700 lb. These tanks normally are filled at storage sites. A single tank truck hauls as much gas as 10 truckloads of cylinders.

Natural gas is being liquefied and shipped to fuel-short countries like England in new-style cryogenic tankers. Other possibilities which could push sales figures way up are in pipelines (double-walled), gas utility and steel mill storage depots,

and about 400 other known ones. A few tanks are used for storing whole human blood, for instant freezing of fresh vegetables, and for similar low temperature use.

Market Potential—The total annual market for cryogenic equipment and gases was estimated at about $400 million in 1960 with projections to $1 billion by 1970. About 1500 tons of aluminum are now being used annually in individual tanks of up to 5 tons for a missile. Alcoa expects about 35,000 tons to be sold in the next two years. Stainless tonnage is somewhat indefinite but less. And 9 pct nickel is in the area of 1000 tons per year.

"Our major concern in manufacture of cryogenic equipment is its leak tight requirements," says T. Stenson White, president of Ryan Industries, Cleveland, largest builder of industrial sizes up to about 12,000 gal capacity.

"We have been using stainless steel type 304 for the inner vessel and carbon steel for the outer. But now we are using a great deal of 9 pct nickel steel for the inner tanks because of economy reasons. Where portability is a factor such as for trucks, or movable tanks, we use type 5083 aluminum."

Other Builders — Other major builders in the field are Chicago Bridge & Iron Works specializing in big storage tanks including missile bases, and Pittsburgh-Des Moines Steel Co., Pittsburgh, Pa.

"These tanks must be built to extremely high standards to minimize heat leak so that no liquefaction or refrigerating equipment is necessary," says Mr. White.

"All solder joints are silver soldered, 100 pct inspected and pressure tested. Inner vessel welds are x-ray inspected. Vessels also get a hydrostatic pressure test, gas pressure test and helium mass spectrometer leak test.

Evacuated Area—"The area between the inner and outer vessels is evacuated and filled with a light volcanic ash to cut heat transfer by radiation and convection. Outside surfaces are painted white for best heat reflection. A 5000-gal tank will stand in the hot sun with gas inside at —300°F or lower for 6 to 8 weeks without losing enough heat to open the pressure safety valve," Mr. White says.

HEADING WEST: A shipment of cryogenic tank installations leaves the Cleveland plant of Ryan Industries for the West Coast.

The gas distribution industry "has changed to about 90 pct cryogenic tank use on most new applications," says C. D McQuinn, field operations vice president of National Cylinder Gas Div. of Chemetron in Chicago.

"The reasons are basically economic. One of our present tankers will carry up to 450,000 cu ft of gas compared with about 45,000 cu ft in pressure cylinders," Mr. McGuinn says. "The cylinders will continue at the small user level with most liquid conversions among those whose consumption has brought them up to tube trailer volume."

This pattern is about parallel with the other industry giants, Linde, Air Reduction and Air Products Corp.

Pulling Out—Independents like Burdett Oxygen Co. of Cleveland are pulling out of the cylinder business and turning it over to distributors.

"We are converting all our large customers to using low-temperature storage tanks rather than cylinders," says E. J. Morse, executive vice president. "This trend started about 1955 and is changing the whole industry. For many new or smaller users, too, it is opening up the economic use of gas in volume by sharply reducing their in-plant handling costs."

In jobs like dismantling ships, for instance, a worker using a torch will go through 5 standard cylinders in a day with a lot of hauling and connecting in between. Now a portable cryogenic tank can be set up and hoses run to the work station for uninterrupted cutting.

Big Scramble—For a slice of a fast growing market like this, steel and aluminum producers are scrambling head over heels.

The most popular inner vessel material is aluminum. Principal virtues are its light weight, good low temperature impact strength, ductility and ease of fabrication. The 5000 series is the most popular. It's about 55 to 60 cents a pound.

The 300 series austenitic stainless is also popular for inner vessels. It's about 60 cents a pound.

The most excitement, however, is centering around 9 pct nickel steel. If it can cut through the red tape, it may slash the price in half. So far it has been limited to small vessels on which welds can be stress-relieved inside a shop. So normalizing furnace size becomes a limiting factor.

Hurdle Cited—To permit its use on larger vessels without having welds stress relieved requires a revision of the present A.S.M.E. code for unfired pressure vessels or a new code. The major producers, U. S. Steel and Lukens, are trying to get this done before the market runs away.

Present output of 1000 to 5000 tons per year is a drop in the bucket compared to its potential. If railroad car, truck and ship transportation and pipelines catch on, 9 pct nickel demand could go out of sight.

Foreign companies do not have so many code obstacles. Countries like Canada, Japan and European firms go into its use first. Then their experience is used in the revision of U. S. codes. This all takes time, of course. Without approval by states, the Interstate Commerce Commission or the ASME, insurance firms won't cover it.

Major Producers — Major producers who have the necessary quenching and tempering facilities are U. S. Steel's Homestead works near Pittsburgh and Lukens at Coatesville, Pa., and Phoenix Steel Co., Phoenixville, Pa. Others who have made it are Timken Roller Bearing Co., Babcox & Wilcox.

Nine pct nickel was invented in 1945 by International Nickel Co. which licenses producers royalty-free. According to INCO's T. N. Armstrong, product development manager and "father of 9 pct nickel," it was first developed for corrosion resistance for heat exchanger towers for hydrocarbon research at Brownsville, Tex.

What's Behind USS's New Pricing System?

The Corporation believes new method of pricing high strength grades will end confusion, make it easier for the buyer.

System lists grade extras for high strength steels which are added to mill base prices of carbon products.

▪ United States Steel Corp. last week eliminated base prices for its high strength grades.

The Corporation substituted instead a system where the base prices of carbon steel are used with extras for added strength and other properties. (See table.)

U. S. Steel says the move will enable customers "to determine better the combination of economic and physical characteristics best suited to the end product planned." The announcement said changes move individual prices up and down but average "about the same."

Spotlights Price Bracket — According to a U. S. Steel official, the new system points up the fact that the high strength group is closer in price to carbon steel than it is to the super strength class. In the past, he said, some customers shied away from high strength grades because they tended to bracket them with alloys that were more expensive.

The steel industry has been working for some time to eliminate this kind of confusion and present a better picture of its structural family. The name, high strength, has been applied to structural grades having yield points between 45,000 and 60,000 psi. These are sandwiched between the super strength grades, which go up to 100,000 psi or more, and carbon structurals, which go up to 36,000 psi.

Differential Noted—Neither the carbon nor the high strength grades are heat treated by the mills. The price differential between these two classes is fairly small.

The super strength steels are quenched and tempered by the mills. From the standpoint of composition, they are classed as alloys. The structural grades sell for about two and one-half times the price of carbon steel.

In selecting a particular grade for a job, the customer must balance out all the strength, weight and price factors.

How New Pricing System Works

Grade Extras Added to Carbon Steel Base Price

High Strength—Low Alloy Steels	Hot-rolled					Cold-rolled sheets	Galv. sheets
	Plates	Shapes	Bars	Strip	Sheets		
USS COR-TEN	2.50	2.50	2.50	2.50	2.50	3.00	3.00
USS TRI-TEN	1.90	1.90	1.90	1.90	1.90	—	—
USS MAN-TEN	1.15	1.15	1.15	1.15	1.15	—	—
USS PAR-TEN	—	—	—	—	1.90	2.275	—
USS EX-TEN 45	.55	.55	.90	.90	.90	1.075	1.075
Abrasion Resisting	1.75	—	1.875	1.775	1.775	—	—

Source: United States Steel Corp.

Pupils Show Economic Ignorance

A Youngstown survey shows pupils in grades 7 to 12 are ignorant of economics.

The majority see industry as greedy and monopolistic. Most want greater government control of jobs and profits.

By G. J. McManus

▪ Steel mills may face a double hurdle in their fight for public support in contract talks next year.

The mills are prepared to justify their own profit standards and economic aims. What may also be needed, however, is an explanation of the whole private enterprise system.

Youngstown Survey — The problem was pointed up recently in a survey of the Youngstown area. Covering students from the 7th to 12th grades, the survey checked reactions to such subjects as big government, industry profits and guaranteed jobs.

About 70 pct felt company owners had received more benefits from new machines than employees had.

Roughly 60 pct said the government should control profits.

Better than 80 pct said the government should guarantee jobs.

In their general attitude, the students tended to look to government for benefits, protection and security. They tended to view industry as greedy and monopolistic.

Home Influence — Student thinking reflected home influences to a considerable extent. There was some trend away from early notions with further education. But on many issues, the first impression was a lasting one.

Most significant, the students revealed a general lack of economic understanding. About one-third could not define the word "profit."

This troubles educators as well as industry. The National Task Force on Economic Education noted in its October report that a growing number of problems call for the public to know how our economy works.

"Yet the vast majority of students graduate from our high schools without the economic understanding necessary to comprehend such problems," said the report.

Most Unaware — One authority goes further. Without understanding, many people don't know there are problems, says D. E. Westenbarger, assistant director, Industrial Information Institute, Inc., Youngstown. He feels many do not see any relation between profits, wages, government spending, taxes, etc.

"The greatest problem is a lack of understanding of the fact that there is a system," he says.

The steel industry has taken some steps to explain this meaning. It has shared the expense of a program aimed at educating clergymen in economic matters. A text book, "Basic Economics," was prepared by L. C. Michelon of Republic Steel Corp., with industry backing.

Greater Effort — However, the need for stronger action is recognized. This is noted by A. S. Glossbrenner, president, Youngstown Sheet & Tube Co.

"This survey struck home to me," said Mr. Glossbrenner. "It showed me that we had better work even harder than we have been working."

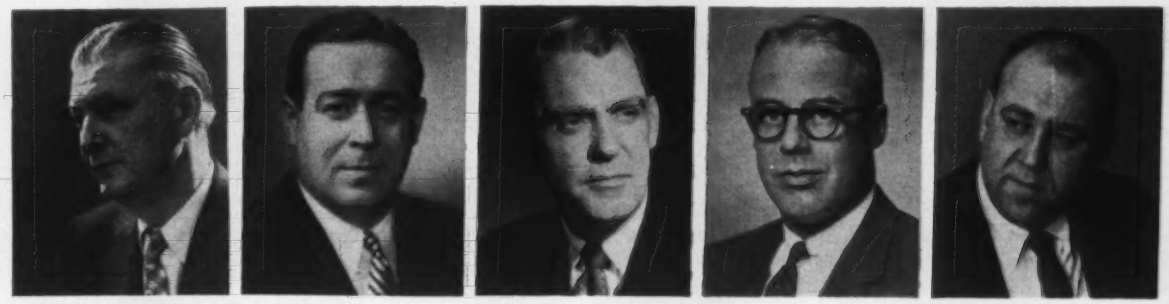
In working harder, however, the mills must still tred softly and slowly. Educators are wary of anything that might resemble a pitch for business interests.

Youngstown's Industrial Information Institute has been able to establish itself as helpful and objective. It is now putting greater emphasis on basic economics. In the past, it stressed the local economy in plant tours. Under a new program, it has prepared a formal course in economics for schools and has distributed it to 30 school districts.

How the Pupils View Industry

	7th Grade	9th Grade	12 Grade
Favor Federal job guarantees	92%	92%	85%
Want Govt. to own and operate essential industries	74%	67%	45%
Favor Federal control of profits	63%	61%	57%
Feel industry benefits more from machinery than the workers	72%	—	67%
Think employees should get bigger share of company profits	63%	—	46%

Source: Feb. 1961 research report of The Public Opinion Index for Industry, Nov. 1961 speech by A. S. Glossbrenner, Pres., YS&T.



G. T. Hook | R. E. McKenna | T. C. Campbell | G. F. Sullivan | E. C. Beaudet

Iron Age Executives Appointed

■ Rapid growth and diversification of the Chilton Co., publishers of The Iron Age, have resulted in new executive appointments.

George T. Hook, publisher of The Iron Age and Aerospace Management, and Robert E. McKenna, publisher of Electronic Industries, Product Design & Development, and Marine Products, have been named executive vice presidents effective Jan. 1. Both Mr. Hook and Mr. McKenna have been vice presidents of the Chilton Co.

Tom C. Campbell, editor-in-chief of The Iron Age, becomes publisher.

George F. Sullivan, editor of The Iron Age, will become editor and publisher of the new Iron Age Metalworking International. The new magazine will start publication in January, 1962.

Eugene C. Beaudet, managing editor of The Iron Age, will become its editor.

Richard D. Raddant, news editor of The Iron Age, has been named its managing editor.

The Backgrounds — Mr. Campbell, the new publisher of The Iron Age, has served in many of the editorial positions of the magazine. He joined The Iron Age as Pittsburgh regional editor, then served successively as news-markets editor, editor, and editor-in-chief before being named publisher.

Mr. Sullivan also served through the editorial ranks of The Iron Age, including positions as Pittsburgh regional editor, markets editor, and managing editor before being named editor in 1955.

Mr. Beaudet served as Chicago regional editor, Cleveland regional editor, machinery editor, and technical editor before becoming managing editor in 1955.

Mr. Raddant was formerly Detroit regional editor and assistant news editor.

New Ore Process Eliminates Coke

A new process which eliminates the need for coke in making iron was unveiled this month at Coolidge, Ariz. That's where Arkota Steel Corp. dedicated its new $1.5 million steel plant.

It's the first commercial-scale plant in the U. S. to use a controlled mixture of hot hydrogen and carbon monoxide gases for removal of oxygen and sulfur from iron ore. The new method is called "the Madaras Process" after its inventor, Julius D. Madaras, an Arkota vice president.

Arkota produces high-purity products for the chemical, ductile iron, superalloy and tool steel industries.

Steel Output Nears 88.5 Million Tons

Steelmaking in the U. S. was 42 pct greater last month than during November of last year.

A total of 88,448,572 tons was poured during the first 11 months this year, according to the American Iron and Steel Institute. Last month's output was 8,749,000 net tons compared with 6,171,940 tons during November, 1960.

Raw steel production during the first 11 months this year was 5.3 pct below the 93,441,760 tons poured during the similar part of 1960. However, at the end of June output had been 26 pct below 1960's first half.

Bliss in Space Field Buys Portland Copper

E. W. Bliss Co., Canton, O., has purchased the Portland Copper and Tank Works, Inc., of Portland, Me. Portland Copper stock was exchanged for Bliss securities.

Portland Copper will be operated as a wholly owned subsidiary. Some expansion is expected in the near future for the supplier of defense hardware. Currently Portland Copper is producing missile parts.

INDUSTRIAL BRIEFS

Mexican Plant—Grove Valve and Regulator Co., a subsidiary of Walworth Co., has started production at its valve manufacturing facility near Mexico City. The plant will aid the company in developing South American markets.

Detroit Building — The R. C. Mahon Co. of Detroit has been awarded a contract to build the 28-floor Detroit Bank and Trust Building. It will contain 6300 tons of structural steel and more than 400,000 sq ft of steel cellular sub-floors.

NACE Awards — The National Association of Corrosion Engineers has selected two corrosion scientists for top awards. C. P. Larrabee of United States Steel Corp., and J. E. Draley of Argonne National Laboratory will be feted.

Drops Merger—Metal and Thermit Corp. has announced that plans for a merger with The Udylite Corp. have been dropped at the request of Udylite.

Stainless Scrap—C. William Howat Co., Chicago, has been established as a broker of stainless steel and other alloy scrap metals. It will operate nationally with associates in major cities and will have an international department.

Castings and Foundry Congress—The 66th American Castings Congress and Exposition and the 29th International Foundry Congress will be held in Detroit, May 7 to 11.

Manganese Producer—American Potash and Chemical Corp. will enter the manganese metal field early next year. The company has installed electrolytic facilities in Aberdeen, Miss.

Magnet Company — Dura Magnetics, Inc., has been formed in Sylvania, O. It will supply Alnico and ceramic permanent magnets and offer precision tool and gage grinding services.

Buys Shipbuilder—Litton Industries, Inc., has acquired the Ingalls Shipbuilding Corp., of Pascagoula, Miss., a builder of nuclear submarines.

Georgia Development — Thiokol Chemical Corp. and Brunswick Pulp and Paper Co. have agreed to develop land for production of large, solid-fuel rocket engines in Georgia. Thiokol will build a plant on Brunswick land.

NACE Officers — The National Association of Corrosion Engineers has elected these officers for 1962-1963: Roland McFarland, Jr., of Hills-McCanna Co., Chicago, president; C. G. Munger, of Amercoat Corp., South Gate, Calif., vice president; C. G. Gribble, Jr., of Metal Goods Corp., Houston, treasurer.

Moves to Connecticut—Hancock Telecontrol Corp., New York City, has moved its Jackson, Mich., manufacturing facilities to Old Greenwich, Conn.

Gas Turbines — An expanded range of jet-powered gas turbines for industry will be marketed by Cooper-Bessemer Corp. The company collaborated with Pratt and Whitney Aircraft Co. in developing a 10,500 hp turbine.

Canadian Purchase — Nopco Chemical Canada, Ltd., has purchased Canadian Aniline & Extract Co., Ltd., of Hamilton, Ontario.

Magnetic Equipment — Eriez Manufacturing Co., Erie, Pa., has acquired the Magnetic Engineering and Manufacturing Co. of Clifton, N. J. The purchase adds an electromagnetic line to Eriez' permanent magnetic equipment.

Massachusetts Distributor—Fastening Service Center of Massachusetts, Inc., of Cambridge, Mass., a subsidiary of H. M. Harper Co., will distribute fastening equipment throughout New England.

Press Lease—A seven-year lease plan has been announced by Verson Allsteel Press Co., Chicago. Leases are available for as little as $10,000 worth of equipment and cover the company's line of press brakes, hydraulic presses and shears.

Bloom Plant — Bloom Engineering Co., Inc., has moved into a new plant and general offices in Pittsburgh. The move triples the company's space.

Cleveland Office—Tube City Iron and Metal Co. has opened a Cleveland office as a step toward creating a Midwest division for the scrap metal organization.

Furnace Atmosphere — Barber-Colman Co., Industrial Instruments Div., is expanding its gas chromatography activities. A Furnace Atmosphere Div. has been established to serve the metalworking industry.

Japanese Production — Racine Hydraulics & Machinery, Inc., has completed licensing agreements with Okano Tenki Co., Ltd., Tokyo, for production and distribution of hydraulic components.

Screw Machine — Veeder-Root, Inc., Hartford, Conn., will complete a modernization of its screw machine facility next year. Machines will be provided by the Brown & Sharpe Mfg. Co.

Propane Facility—Texas Eastern Transmission Corp., has opened a new Princeton, Ind., facility. It includes a storage cavern and truck terminal.

Catapult-Arresters—E. W. Bliss Co. has received a $2 million order from the Dept. of the Navy for aircraft catapult and arresting equipment. The units will be used mainly by the Marine Corps in forward areas where long airport runways are not available.

Michigan Construction — Construction of a new plant which will double presently available space has been started by the Instrumentation and Control Div. of PneumoDynamics Corp. The new facility to be in Grand Rapids, Mich., will be completed in early 1962.

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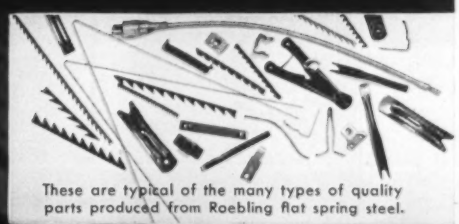
. . . *our* records show that when a manufacturer once discovers the exceptional and uniform quality of Roebling flat spring steel, he becomes a permanent Roebling customer.

Your records for faster production and lower costs can be improved, in large measure, by Roebling's strict attention to supplying you with the finest flat spring steel available. When you need flat spring steel, specify Roebling. Write Roebling's, Wire and Cold Rolled Steel Products Division, Trenton 2, New Jersey, for complete details.



These are typical of the many types of quality parts produced from Roebling flat spring steel.

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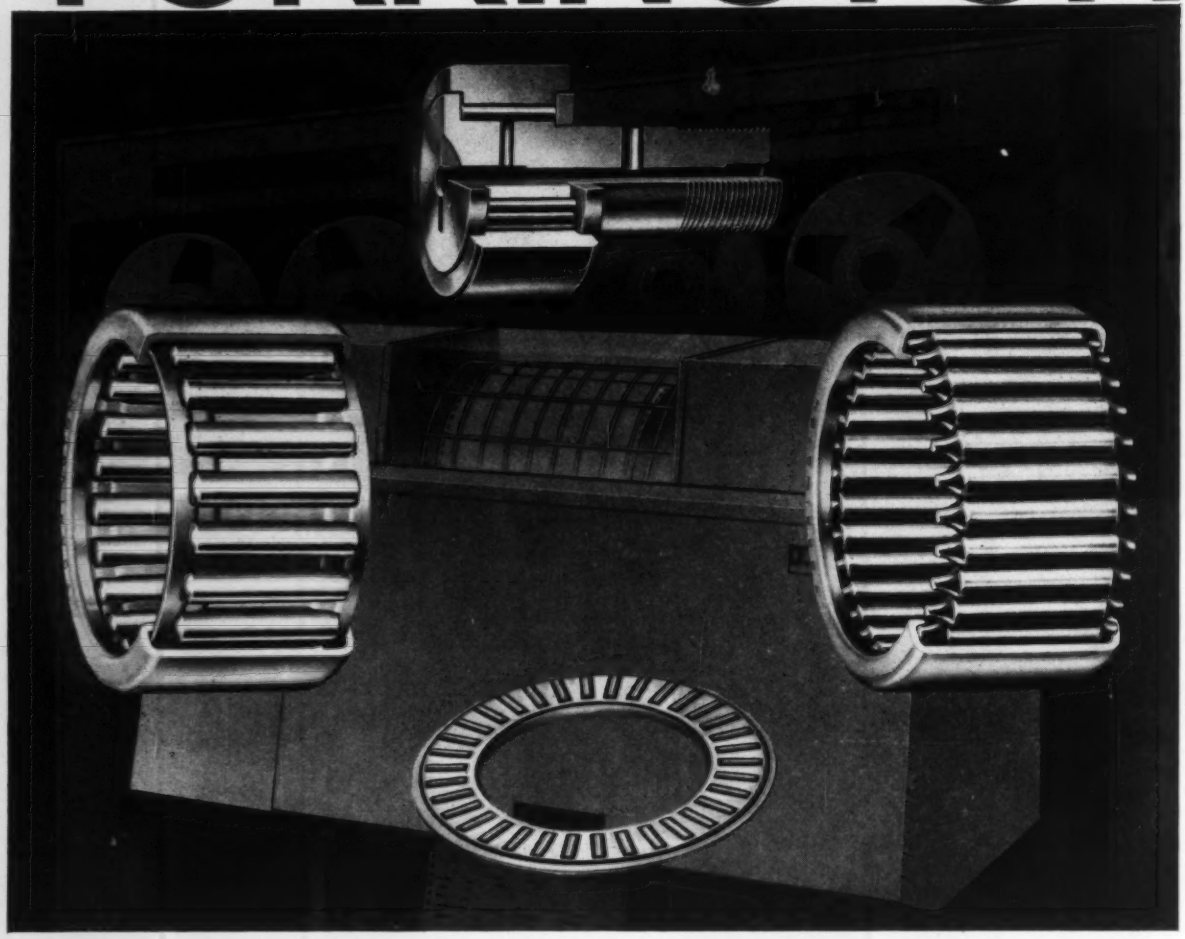

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Opportunities Pose Problems

Research and development, population growth and other factors will offer great opportunities to managers during the '60's.

But they also pose problems which need a solution.

■ Rapidly increasing spending for research and development is counted on to help power the long-range boom in the 1960's. Other important influences are: The growing population, the higher educational level, and changes in living patterns.

All these offer great opportunities for managers. Yet all pose problems which must be solved.

For economic growth, efficiency, and job creation in the 60's, for example, there must be a high and rising level of investment.

Sixty Leaders—That's the opinion of more than sixty business leaders, government officials, and economists as noted in a new National Industrial Conference Board publication. The book, "American Enterprise: The Next Ten Years" resulted from the NICB's third annual Economic Conference.

It points out less than nine million people were added to the work force in the last ten years. But in the next ten this may increase to 13½ million. "Never before has this nation been asked to find productive jobs for so many young people in so short a time," says the NICB.

Capital investment will play a big part in creating the job opportunities for these new workers. Annual capital spending for new fixed investment must run substantially above its level of the 1950's.

R&D Spending — Another vital factor is investment in research and development. This accounted for $2 billion in spending (less than 1 pct of national output) in 1947. It's now estimated at more than $12 billion, or about 2.5 pct of national output. By the closing years of the 1960's spending for R&D may more than double its present annual rate.

With so much spending underway, careful planning is needed. E. Finley Carter, president of the Stanford Research Institute, recently told the American Ordnance Assn. some of the ways industry can improve performance in defense research work.

Must Study—"As managers," he said, "we are challenged to make more effective use of scarce technical resources. We must study creativity—how it may be recognized, nourished, and developed.

"We must study environments to determine what combinations of factors produce the best research results. We must seek economy of time and effort by encouraging scientists and engineers to take advantage of existing inventions and discoveries which may fit into their over-all projects, rather than applying the 'not invented here' factor.

"We must study the problems of communicating systems concepts and goals to scientists in terms which are meaningful to them . . ."

How to Measure Performance

■ How do you measure management performance and predict management success?

Despite all the ways used to measure the success of general managers the methods are still primitive says one expert. He's Dr. Thomas W. Harrell of Stanford University's Graduate School of Business and Department of Psychology.

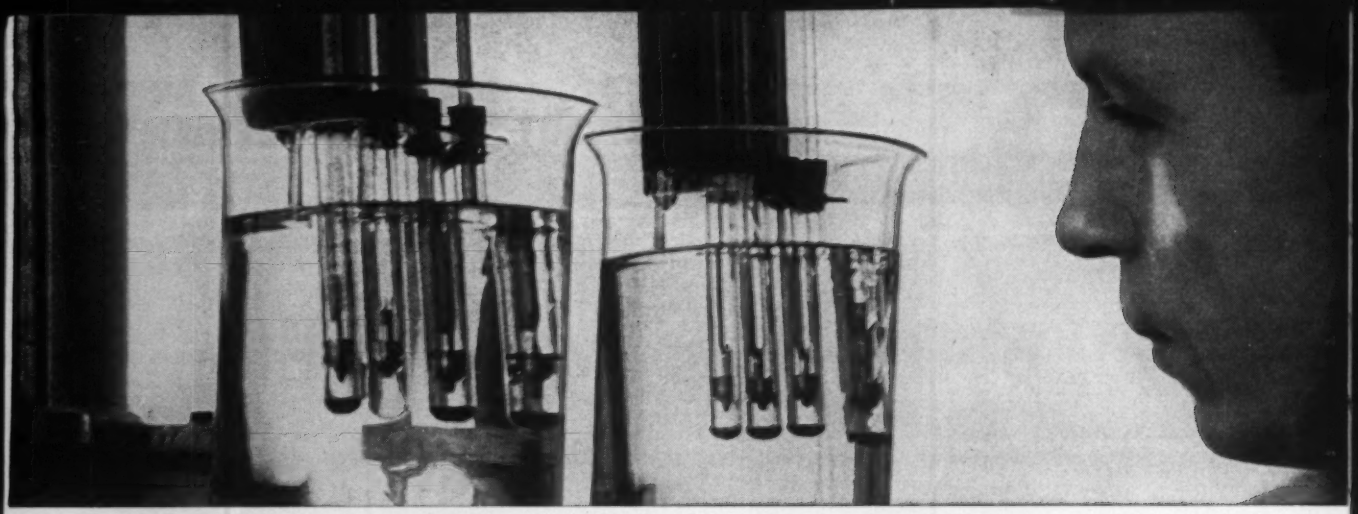
In a new book, "Managers' Performance and Personality," he says, "The most widely used criterion for measuring success is the simple fact that a man holds on to his job.

Doubts Validity—"For functional managers—those in sales, production, finance, and research—individual ratings are the most ferquently used yardstick. But whether any rating is valid in terms of objective results remains to be demonstrated," he adds.

Surveys show, Dr. Harrell points out, that the first job of top managers is picking their functional managers. Second in time and importance is motivating the president's subordinates.

Promoting innovations, planning, and staff coordination also demand the time of those at the top.

Less Emphasis — "In recent years," Dr. Harrell notes, "management researchers have paid more attention to good supervisory practices. There's less emphasis on the personality traits associated with leadership."



Dropping point test shows how greases react to heat. Beaker fluid has been heated to 390°F. All greases tested except Darina (second tube from left) have passed from solid to liquid state.

BULLETIN:

Shell reveals the remarkable new component in Darina Grease that helps it save up to 35% on grease and labor costs

Darina® Grease is made with Microgel*, the new thickening agent developed by Shell Research.

Darina lubricates effectively at temperatures 100° hotter than most conventional soap base greases can withstand.

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Saves money

Shell Darina can reduce maintenance expenses while it protects your machinery. Savings of up to 35% on grease and labor are quite possible.

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Business Taxes and Depreciation

In this interview, Treasury Secretary Douglas Dillon tells of the Administration's plans for revising business taxes next year.

His answers cover depreciation, investment credits, lobbying expenses, foreign income and the chances for overall tax reform.

Because of its vital importance to metalworking management, the interview deals in depth with depreciation schedules and the ins and outs of investment credits.

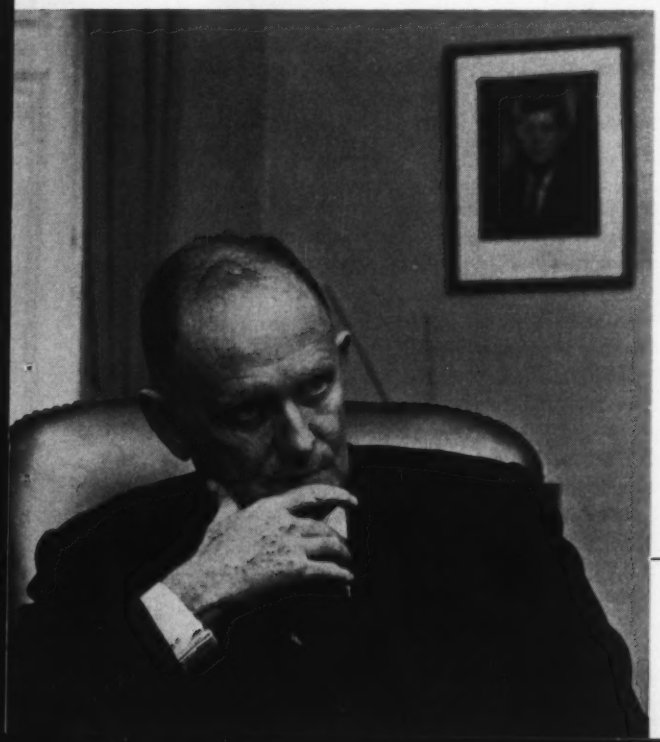
By E. C. Beaudet

■ **Q. Mr. Secretary, are present depreciation laws adequate?**

A. No. Neither the present laws nor the guidelines under which they are administered are adequate. We can greatly improve existing administrative practices. This is what we are aiming at in the current review of depreciation schedules. A first step was the decision to cut the suggested "useful lives" of textile machinery by an average of 40 percent. Our over-all study should be completed by this spring, at which time we expect to promulgate new, modernized guidelines for useful lives that will take account of technological developments and changes in business practices in the twenty years since 1942, when our current Bulletin F guidelines were published.

But this will not be enough. Changes in the law are also required if American business is to receive tax treatment for its investment in machinery and equipment that is comparable to that granted to their competitors in Western Europe and Canada. This is what our investment credit plan is designed to do.

Both steps are essential if American companies are to compete successfully with foreign companies, which have been modernizing their equipment faster than American manufacturers and which are not only cutting unit costs but also improving quality in the process—adding to the advantage they have in relatively lower wage scales. American manufacturers are disadvantaged, not only by the more rapid depreciation given many of their competitors abroad, but also by the fact that many of these competitors receive a special tax allowance in the year in which they acquire new equipment. We are moving to correct both these aspects.



■ **Q. What is meant by the Administration's "dual" approach to depreciation reform to encourage plant modernization?**

A. First, the revision of suggested "useful lives" currently under way—of which the textile decision is an example—and second, the proposed investment credit for expenditures on new and some used equipment.

■ **Q. Is this dual approach a mere stopgap measure, in lieu of thorough revision of business taxes, or do you feel it is, in itself, a sufficient stimulus to a higher rate of plant investment?**

A. I regard the investment credit and the shortening

TREASURY SECRETARY DILLON: "We are convinced that Bulletin F, as a whole, is out of date."

of useful lives for tax purposes not as stopgaps but rather as major elements of our over-all tax reform, with enormous potential to stimulate greater business investment. They have priority because of the important help they can give to our balance of payments by enabling business to cut costs, and improving the competitive position of our exports, as well as by keeping prices down at home.

"Industry is now shifting its viewpoint on the tax credit plan because businessmen sat down and did some homework."

Our comprehensive tax reform recommendations to be submitted to Congress next year should, in addition, provide significant stimulation to the entire economy by creating a broader and more equitable tax base and a revised rate structure.

■ **Q. With the depreciation review and the investment credit plan both still pending, would not businessmen be well advised to delay making new investments wherever possible?**

A. I think not. The new depreciation schedules, when determined, will be made applicable to assets already in use, as they were for textile machinery. As for the investment credit, we hope that Congress will act on it early next year to end any uncertainty. It is likely that it will apply to equipment acquired any time after December 31, 1961.

■ **Q. Generally, business greeted the reduction of depreciation schedules on textile machinery with enthusiasm. What did this reduction entail and why was it granted?**

A. The reduction amounted to 40 percent, on the average, from the schedule of depreciable lives suggested in Internal Revenue's Bulletin F. It was granted because the textile industry was able to produce a documented case proving that a major technological breakthrough had occurred which made the suggested lives in Bulletin F unrealistic. Our engineering studies confirmed the industry's findings. The decision granting shorter lives for tax purposes for textile machinery was made in advance of completion of similar studies of other industries because President Kennedy, as part of his over-all program for the textile industry, has directed that the study and decision be expedited.

■ **Q. Recently you announced that the Treasury Department will undertake a review of the depreciation schedules of six major industries: aircraft; automotive; electrical machinery; metalworking machinery and machine tools; railroads and steel. Did the effect of foreign competition have a bearing on the choice of any of the six industries selected?**

A. No. We chose the industries rather broadly, to cover the spectrum of technological development and also to cover a wide area of capital assets.

■ **Q. This approach sounds like that of the Canadian bracket system. Does this mean the Treasury Department will eventually get rid of Bulletin F and its useful life schedules?**

A. We are convinced that Bulletin F, as a whole, is out of date. Our engineering studies of useful lives will enable us to make Bulletin F more timely and flexible. By periodically revising Bulletin F schedules we hope to have it match the facts of useful life. But we are not now planning to drop it.

■ **Q. How might the reduction be made—industry-by-industry or by an over-all percentage decrease for all industries?**

A. Definitely the former. But it will not be done piecemeal. We intend to announce the entire revision when all our studies are completed.

We will make the determination of new useful lives —where we decide they are justified—as scientifically as possible, based both on past industry experience and on anticipated technological change and obsolescence. We will examine what is presently on the drawing boards to try to determine, insofar as possible, where technological breakthroughs are likely in the near future.

A flat across-the-board reduction in useful lives would not be permissible under existing law and, in addition, would fail to achieve the very thing we want; namely, enabling industries with rapidly advancing technology better to avail themselves of that technology.

■ **Q. Some businessmen say an industry-by-industry revision of useful life schedules would become bogged down in detail, and delay depreciation revision. How do you feel about this?**

A. This will not be the case. We are well along with our depreciation study. Once we have completed it, the revisions in useful life schedules will be forthcoming promptly—as in the case of the textile industry.

■ **Q. Do you believe further depreciation revision would take into account differences between large and small companies?**

A. Existing law does not permit any distinction regarding depreciable lives on the basis of size, as such. The proposed investment credit, however, will give a

relatively greater advantage to the company with earnings of $25,000 per year or less, and that is among the many reasons why we favor it.

In addition, the investment credit plan is also relatively more favorable to smaller firms in permitting the credit to wipe out a company's entire tax bill if that bill is $100,000 or less. The credit would be allowed only up to 50 percent of the excess over that amount.

■ **Q. Should depreciation revision take into account the extent to which an industry or company is suffering from foreign competition?**

A. The law requires us to establish rules for depreciation which grant a "reasonable" allowance, and that concept does not encompass the problem of foreign competition as such. It may well be, however, as in the case of textiles, that some of the industries suffering most seriously from foreign competition are those in which technological advance has been most rapid, and which will, therefore, be most entitled to reduction in the useful lives of their equipment.

■ **Q. Many businessmen feel that the best depreciation system would be one which allowed them to follow any consistent method of writing off the cost of their equipment. Is this feasible?**

A. If what they mean is complete "expensing" of their capital investment—that is, charging off the entire amount as a business expense in the year in which the asset is purchased—the answer has to be: "No, it is not feasible." The revenue impact on the Treasury would be enormous—upwards of $17 billion in the first year, at present rates of investment.

Any depreciation system short of "expensing" which nevertheless writes off assets a great deal faster than is realistic would also be very expensive and would distort the proper measure of income.

■ **Q. Briefly, what is your personal feeling about the economic soundness of other suggested methods of depreciation revision? First, the Canadian or Bracket system?**

A. This is one of many ideas we are currently examining. It provides, by delegation of authority to the administrators, fixed mandatory useful lives for various broad categories of assets. Its chief merit is simplicity. In considering the Canadian system, however, it should be borne in mind that the useful lives it establishes are rigid; they apply for tax purposes even in cases where the expected period of use is shorter. It might be possible to move toward the simplicity of the Canadian classification system and still retain some of the flexibility of the American system. We'll have a better idea shortly.

■ **Q. Faster acceleration during early years of life?**

A. Our double declining balance and other systems of accelerated depreciation already give American firms a substantial portion of their depreciation write-off during the early years following acquisition of an asset. I doubt that it would be appropriate to go any further in this direction.

■ **Q. Price level adjustments?**

A. Any such allowance for changing prices would involve a fundamental departure from our basic tax law concepts. If we give an allowance for inflation to the purchaser of tangible equipment, then why not to the purchaser of fixed-yield securities, who also loses out because of inflation? Any move in this direction would open Pandora's box.

■ **Q. A selective program of accelerated depreciation, perhaps five-year amortization, for selected industries experiencing economic difficulties?**

A. We don't think this is a good idea.

■ **Q. The House Ways and Means Committee, in its tentative draft legislation, has changed somewhat the Administration's original proposal for an investment credit plan. As it now stands, just what does this plan involve?**

A. Its essential feature is a credit against taxes for investment in new equipment and to a limited extent in used equipment. The credit amounts to 8 percent of the cost of the asset and is taken against taxes due in the year in which the equipment is installed. The credit would be available across-the-board to almost all companies and to almost all kinds of investment, except in buildings. There are a few exceptions, for example, utility companies or equipment going into residential properties, such as hotels. The credit would be allowed to offset a firm's entire tax bill up to $100,000, but would be limited to 50 percent of the excess over that amount. Unused credit could be carried over for a five-year period. For used equipment the credit would be limited to purchases of $50,000 annually by a particular business firm or taxpayer. This provision is intended to help those small businesses which may not be able to afford expensive new equipment.

"Modernization is required to assure strong growth of our domestic economy."

■ **Q. What are the special merits of this plan?**

A. It provides maximum encouragement for modernization of equipment with minimum revenue loss to

THE VITAL ISSUES

This interview with Treasury Secretary Dillon is the fourth in a new Iron Age series on the vital issues facing management.

Earlier interviews include: Attorney General Robert F. Kennedy on antitrust laws; Federal Trade Commissioner Paul Rand Dixon on pricing regulations; and Dr. George W. Taylor on labor-management problems.

Reports from other high-ranking government and business executives involved with the vital problems affecting metalworking will appear in future issues.

the government. Modernization is required to assure the strong growth of our domestic economy, and to keep our exports competitive.

Independent studies by private organizations confirm our estimate that the credit, as embodied in the present Ways and Means Committee draft, would be equivalent, in its stimulating effect, to a 40 percent depreciation write-off in the first year. But the first year's revenue cost of such a 40 percent write-off would exceed $3 billion, whereas the credit, at 1961 rates of investment, would cost only $1.2 billion.

■ **Q. At first business pretty generally opposed the tax credit idea. Now more industry groups and individual companies are backing it. How do you account for this?**

A. Industry is shifting its viewpoint on the tax credit plan because businessmen sat down and did some homework. Their homework showed them that the proposed 8 pct across-the-board investment credit has the same benefits as a 40 pct first year depreciation writeoff.

We've had some very widespread interest expressed in the plan by heads of companies who now think it is a good thing. We will also get the support of more industry associations.

■ **Q. What might be the long-term effect of the investment credit plan on federal revenues?**

A. Our tax plan will allow industry to buy more equipment. More equipment buying makes more business, which, in turn, makes more taxes. The feedback effect will actually mean more revenue in the future. We have seen in the past that investments in capital equipment goes up as the capital flow arising from depreciation goes up.

■ **Q. How does the tax credit idea compare with similar plans in other countries?**

A. There are several countries which permit—as would our investment credit plan—a tax allowance for investment, over and above the ultimate deduction, through depreciation, of its entire cost. Each plan is different. Britain has allowed a deduction in excess of cost which has varied in amount over the years. As a deduction, rather than a credit, it is relatively less favorable to small business than our plan. The Netherlands provides a similar deduction of 10 percent over and above depreciation for eligible investment.

Belgium has a law based on the sliding scale idea we originally proposed, under which the amount of the credit would increase as the new investment rose relative to a base figure. And Canada inaugurated a plan based on a very similar concept only this year.

A number of other countries have provisions for large, first-year write-offs. We believe the credit method is a better approach, for the many reasons suggested in previous answers and because, unlike initial write-offs, it cannot affect costs or prices.

■ **Q. What might be the immediate and long-term effects of the tax credit plan on Federal revenues?**

A. It was estimated that the 8 percent across-the-board investment credit would have reduced tax liabilities by $1.2 billion if it had been adopted in 1961. The amount will be somewhat higher in 1962 and future years as the level of investment rises. On the other hand, judging from the experience of other countries, by stimulating modernization and thus helping to create a healthier, more competitive economy, the long-term effects of the tax credit can be expected to strengthen Federal revenue collections.

■ **Q. Do you think Congressional approval of the investment credit plan may delay other needed depreciation reforms?**

A. There is no reason why it should. We have already begun the shortening of useful lives, which we can do administratively.

In addition, the draft bill now pending in Congress contains other elements of depreciation reform. It liberalizes the treatment of salvage value in figuring depreciation and, in order to permit these liberalizations of depreciation, it limits the capital gains treatment of profits made on the sale of used equipment.

■ **Q. As you see them, what are the alternatives to acceptance of the tax credit plan?**

A. We hope we will not have to choose among less helpful alternatives. Both the investment credit and a shortening of useful lives are needed. There is growing evidence that both Congress and the business community are recognizing this. Support for our dual program is steadily growing.

■ **Q. There have been objections to the feature of the investment credit proposal which limits the credit to**

50 percent of a company's tax in a given year. Why do you want this limitation?

A. We think it is inappropriate for us to permit corporations with large incomes to escape all tax liability. The 50 percent limitation actually applies only to that portion of a company's tax in excess of $100,000. Of the more than 1,000,000 corporations in this country, only about 14,000 have a tax bill as large as $100,000, so the limitation would apply only to a relatively small number of companies.

■ **Q. It has been suggested that companies be allowed to apply for tax credits at the start of and during a long-term expansion program extending over several years. What is your opinion?**

A. I do not see the need for this. The construction of new plants can often extend over a period of years but investment in buildings is not covered by the credit. I see little problem concerning machinery. It will become eligible for the credit as soon as it is acquired and the benefits of the credit would be received beginning with the first quarterly tax return thereafter. In any event, it's hard to see how it would be administratively feasible to grant a tax credit on mere investment intentions, which can and do change.

■ **Q. The charge has been made that the investment credit idea penalizes unprofitable companies or industries and provides a greater inducement for more profitable companies to modernize while unprofitable ones will slip further behind. What is your answer to this?**

A. There is no change that can be made in depreciation to help a company with no earnings.

■ **Q. What changes do you think should be made in the pending version of the investment credit plan?**

A. We find the tentative Ways and Means Committee draft a fully acceptable alternative to our original proposal. Naturally a few minor technical changes may prove to be desirable.

■ **Q. Do you think there should be changes in the tentative Committee draft on tax deductibility of business expenses?**

A. We would prefer to return to our original recommendations on disallowance of entertainment expenses and would prefer to use more specific standards for travel expenses. This would be easier to administer than the Committee draft. However, the Committee draft is a substantial improvement over the present law. The fundamental point is that we must have new legal authority to put an end to well-publicized and widespread abuses in the expense account area.

■ **Q. What changes do you believe will or ought to be made in the foreign income section of the draft bill?**

A. While the Ways and Means Committee included some of our suggestions in their discussion draft, they indicated that they would prefer to consider draft legislation limited to "tax havens" rather than our proposal to terminate tax deferral on the earnings of United States subsidiaries located in developed countries. Accordingly, while we feel as strongly as we did a year ago that there is no longer any justification for continuing this inducement for American investment in industrialized countries, the draft submitted by the Treasury deals with "tax havens" rather than with tax deferral generally.

■ **Q. Briefly, what do you expect the President's over-all tax program for the next session of Congress to contain? Will it call for a revision on as broad a scale as the revision of 1954? When will it be ready?**

A. What we have in mind is a thoroughgoing approach to tax reform—a program which will permit re-examination of tax rates because it will also involve a broadening of the tax base by elimination of special tax preferences which are not justified. It will be considerably broader and more far reaching in its policy objectives than the 1954 revision. We expect to have this over-all program ready for submission to the Congress by late spring after it has had the time to finish its work on the pending tax bill.

■ **Q. Will the Administration's over-all program call for changes in the taxation of capital gains? What kind?**

A. The capital gains area is one of many we are reviewing. No decisions have been made yet as to what, if anything, we will propose.

■ **Q. Do you expect to recommend any changes in taxes on dues to associations or on lobbying expenses?**

A. No.

■ **Q. Finally, Mr. Secretary, do you believe it is possible to have tax reform with all its closing of loopholes next year and get it through Congress, particularly since 1962 is an election year?**

A. No. Our new proposals will not be ready until late spring. Congress will need time to study them. In addition, the two committees which must handle tax legislation—House Ways and Means and Senate Finance—will have already dealt with our currently pending tax proposals and will be busy with other legislation of utmost importance, including the medical care bill for the aged and the Administration's trade program. But a good beginning can be made by national discussion of the whole concept of tax reform. We hope for over-all tax reform legislation in 1963.

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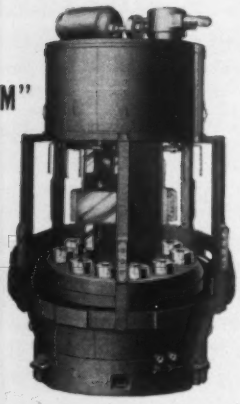

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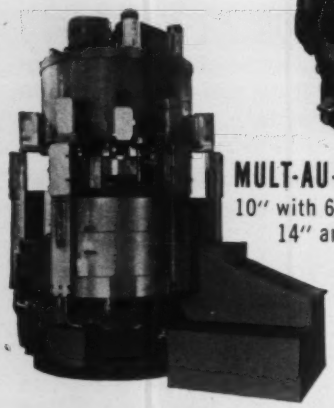

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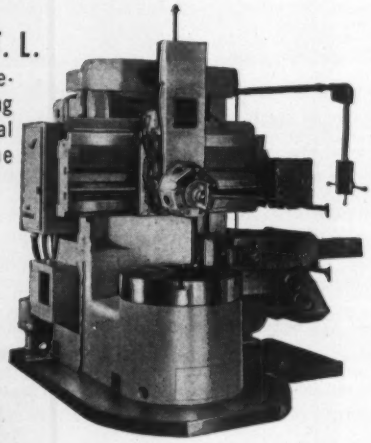

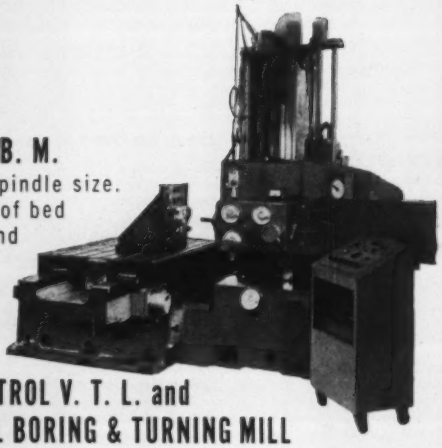

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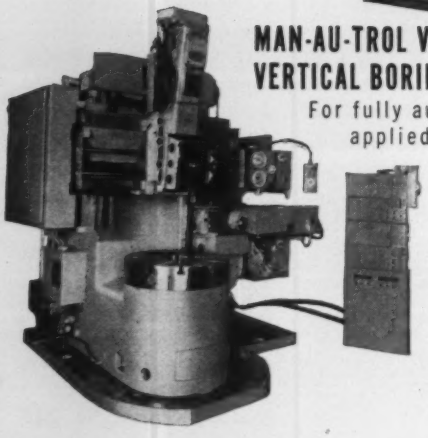
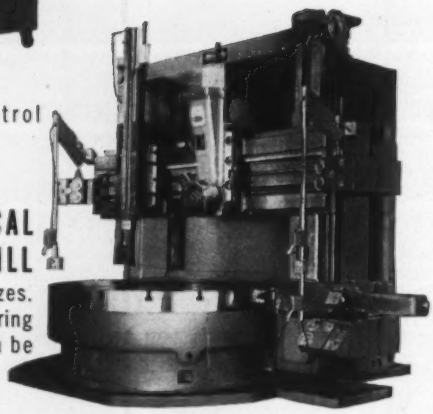


MAN-AU-TROL V. T. L. and VERTICAL BORING & TURNING MILL
For fully automatic operation, can be applied to any or all heads of Dynatrol at time of ordering or at later date.

DYNATROL VERTICAL BORING & TURNING MILL
108", 124", and 144" table sizes. Discrete positioning or contouring numerical control system can be applied.



Lubed-for-Life Trend Started

Metal and Rubber Joined in Pre-Lubricated Bearing

Auto makers are trying to increase periods between chassis lubrications to 100,000 miles.

The goal is a long way off, but one manufacturer is joining metal and rubber in components to increase the span between lubes.

By A. E. Fleming

■ There is evidence of increasing use of rubber-and-metal parts by the automotive industry.

The Problem — Chassis lubrication for most 1962 cars is advised every 30,000 miles. Auto makers are trying to get even longer periods of extended lubrication as much as 100,000 miles.

This means "permanently lubricated" parts must be used throughout the suspension and steering systems.

"The trend toward lubed-for-life automobiles still has a long way to go," says M. J. Fleming, Jr., president of Clevite Harris Products Inc., A Clevite Corp. subsidiary.

Clevite Harris has just completed an expansion program which has added 50 pct more manufacturing space to its rubber manufacturing facilities in Milan, O. The Company's Napoleon, O., plant, where metal parts of its products are manufactured and where final assembly takes place, was completed in 1953.

New Product—Mr. Fleming says part of the new space at Milan will be used for turning out a new product, Clevebloc, a prelubricated rubber bearing, currently in production for American Motors Corp., which is using it for the first time on all 1962 models.

Clevebloc parts are under test by all U. S. car makers and by several foreign producers, points out Mr. Fleming.

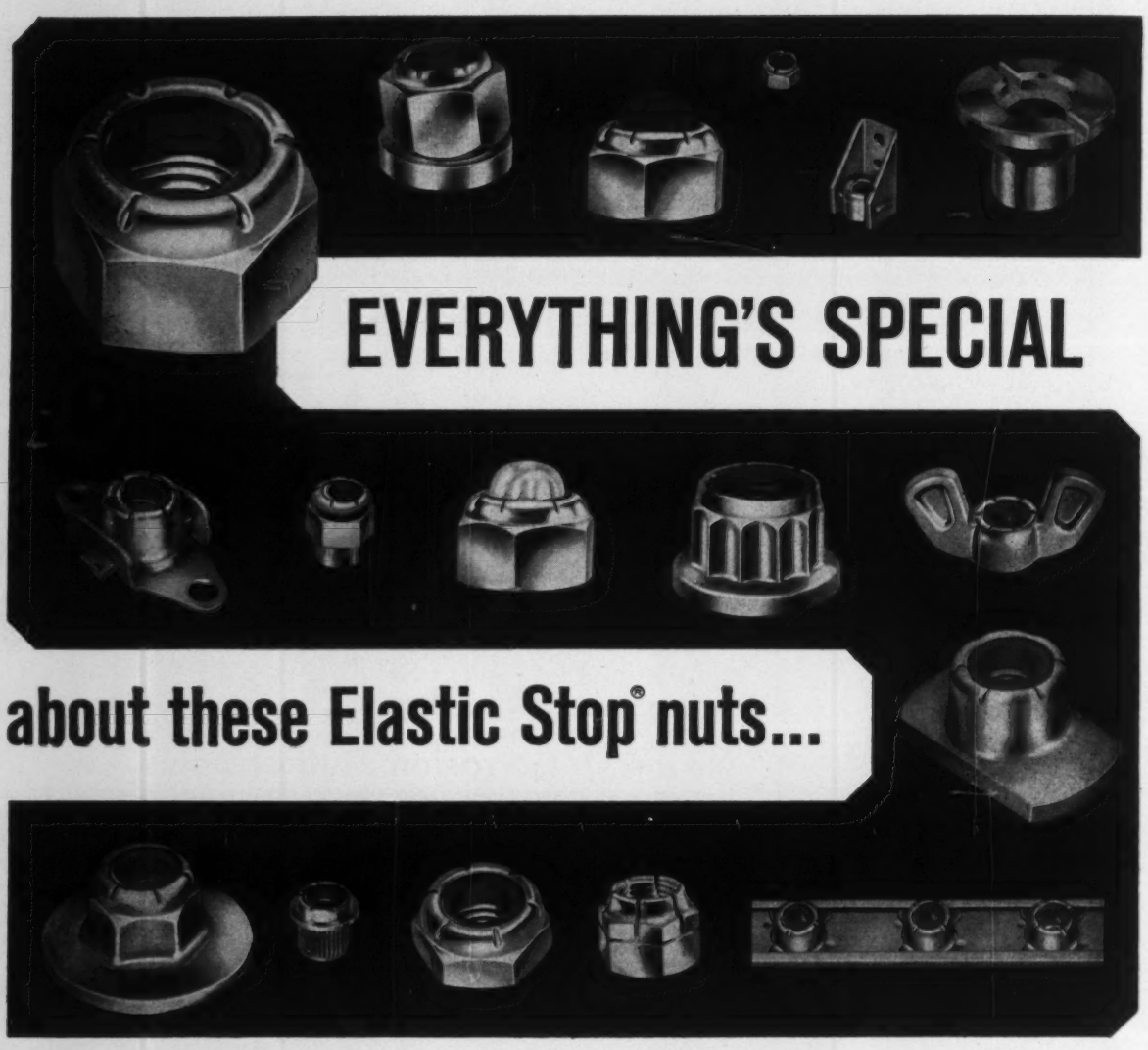
According to R. T. Drake, chief engineer of Clevite Harris Products, the Clevebloc product represents the first practical use of rubber as a prelubricated bearing. They're being used as idler arm bushings in the Rambler steering systems.

Two Parts—The device consists of two components, rubber bonded to a metal insert and a plated, outer steel tube. A special lubricant is permanently sealed between the waffle-surfaced rubber and the outer tube, permitting the tube to rotate on the rubber.

Complete steering linkage is among the Clevebloc units under test. Harris Products French licensee, Repusseau, will ship its first productions in January for installation on a 1962 French car. It's expected that other auto companies in the U. S. will also include the product on 1963 models.

New Anti-Corrosion Muffler Bows

NEW MUFFLER: A new all-stainless auto muffler is being made by Hayes Industries, Inc., of Jackson, Mich. It's aimed at annual $375-million corrosion problem and uses Allegheny Ludlum Steel Corp.'s stainless MF-1, specially designed for this application.



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about these Elastic Stop® nuts...

...except their availability and ultimate cost to you.

Elastic Stop nuts come in hundreds of shapes and sizes. We have illustrated just a few to show you it is possible to choose a nut shape that will make your assembly job easier and faster.

How can you always be sure you have the real thing? Easy! The unique, instantly identifiable red nylon locking insert is your clue to an Elastic Stop nut's special brand of shakeproof, shockproof locking performance. Once you see "the ring of reliability" you know that *this* locknut is going to stay put . . . on any bolted connection . . . for as long as you want it to stay! It will not come off until it's wrenched off, and then it can be reused fifty or more times.

If your product's performance depends on tight bolted connections or precise adjustments, Elastic Stop nuts are the best, lowest priced, reliability insurance you can buy. And in figuring "true costs" the final figure should never be based on initial price alone. Value analysis has repeatedly demonstrated that product breakdowns or serious field service problems attributable to fastener failure easily cost more than the modest price of an Elastic Stop nut. The *ultimate cost* of stop nut quality and performance can make them today's "best buy."

ESNA's 30-year background in design and production of self-locking nuts assures you the most complete line in the business. For complete flexibility to meet your size, shape or volume requirements call on ESNA.

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for the ring of reliability

Automation Problem Assessed

It Can Lead to Growth or a Frightening Crisis

Government leaders discussed the problem at Gov. Brown's conference on automation.

Experts agree that the overall effects of automation must be shared by industry, labor, and government.

By R. R. Kay

■ Each week 35,000 American workers lose their jobs to automation. So says W. Willard Wirtz, Under Secretary of Labor.

"Automation poses one of the most important problems to our nation." That's the judgment of one of the country's top labor relations experts, Dr. Clark Kerr. He's president of the University of California and member of President Kennedy's Labor-Management Committee.

Governor's Conference — Both these experts spoke in Los Angeles at Governor Edmund G. Brown's Conference on Automation — one of the first sponsored by a governor. Some 400 California business, labor, and education leaders jam-packed the sessions.

Dr. Kerr and Under Secretary Wirtz are agreed that the huge price of automation must be shared by industry, labor, and government.

How to make automation a boon and not a boomerang?

Spread Cost — Said Mr. Wirtz: "In our adjustment to rapid technological changes, we should be guided by the principle of spreading the costs of automation instead of placing it on those individuals adversely affected by it."

Here is the thinking of Dr. Kerr and the undersecretary:

Shortening the 40-hr work week is not the answer.

Productivity and national growth must be beefed-up by 4 pct to 5 pct per year during the 60's.

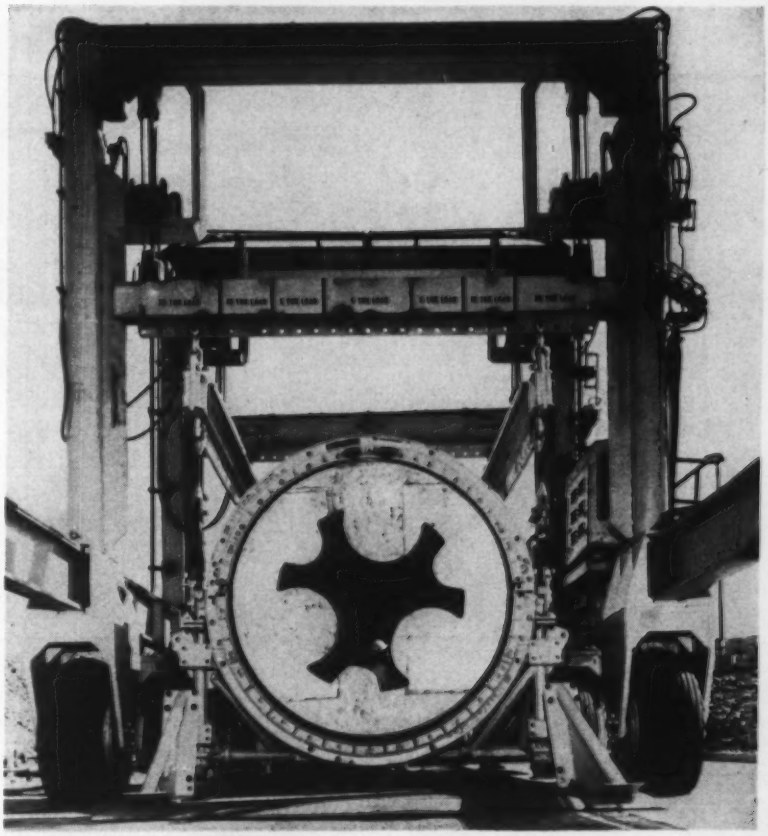
Worker's Needs — Labor unions must relax seniority rules. Management must give advance notice of displacements and the need for new skills.

Federal and state governments must improve their communications —matching the jobless in one section of the country with job openings in another section.

Government's Role — The labor undersecretary says that if industry fails to make jobs through expansion, the Administration will consider a huge public works program.

Gov. Brown cautioned the delegates, "If large-scale displacement occurs in a shrinking economy, we could have a crises of frightening proportions."

Positioning Gigantic Rocket Sections



MOUNTED MOTOR: This huge self-propelled carrier can position a rocket motor section weighing several tons for joining. Berkeley Steel Construction Co. fabricated the carrier for Aerojet-General Corp.

SUN QUENCHING OILS

Keep coolers cleaner longer . . . combine quality with economy

1 Get Low Operating Cost From Natural Detergency

Sun Quenching Oil Light is a naphthenic quenching oil with a natural detergency that keeps coolers clean. One large auto manufacturer reported a cost drop of over 90% in cooler maintenance after switching to Sun Quenching Oil Light.

2 Get Maximum Physicals In Your Steel

Sunquench 1070 is particularly important in fast-quenching operations because it cools at the optimum rate during the critical stage, minimizes distortion, deepens hardness. With Sunquench 1070, you may be able to substitute lower alloy steels for more expensive grades. Exceptional thermal stability of Sunquench 1070 means long life.

3 Get Brighter Parts

Sun Quenching Oil 11 is a premium-quality paraffinic quenching oil designed for work requiring an oil with a high flash point. It is particularly good for bright quenching. Its high thermal stability prevents decomposition and the resultant streaks on bright-quenched parts.

4 Get Longer Marquench Oil Life

Sun Marquenching Oils are dewaxed paraffinic oils made for controlled martempering at temperatures as high as 400 F High flash and fire points keep Sun Marquenching Oils safe. High oxidation-resistance increases their useful life in your quench tank.

TALK QUENCHING with the Sun man. He'll show you how one or more of these Sun Quenching Oils can handle all of your needs. Or write to Dept. IA-12.

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How Much Numerical Control?

Some Question Its Value to Volume Production

It's conceded that numerical control for industrial production is here to stay.

But some say the type of job should determine whether it's the preferred method.
By R. H. Eshelman

■ Many builders and users of machine tools often ask: Is numerical control the final answer to all production problems? Or, does it have economic and practical limitations?

Machine tool and production experts warn that tape cannot write off present basic manufacturing tools and methods overnight.

Even the most optimistic exponent of numerical control say its greatest value is in the field of short run, varied production.

Many machines that lend themselves to this operation are relatively simple mechanisms, such as drill presses, milling machines and turret lathes.

Skeptical of Value — Experts question present use of tape control for volume production. For instance, T. Laurence Strimple, president of National Acme, says:

"We point to continued need for precision mass production of myriad components for modern automobiles, television, radio, home appliances, business machines, aircraft, farm equipment, and ordinance.

"Results of our research and development thus far fail to indicate how numerical control concepts can improve the already completely automatic operation of bar chucking machines for these jobs."

Once an operator starts up a machine it automatically performs a whole series of predetermined machining operations. Without "letting go," the work is indexed from position to position within the machine until the last operation is performed. Automatic loaders, conveyors, and electric controls round out the automation.

One Component — A high-production automatic may spend its entire useful life on the production of a single type of component. For example, an automotive part may be produced in many hundred thousand lots yearly.

National Acme continues to invest in new machinery itself, as well as in research and development ($640,000 in the first six months of 1960). Its aim: To reduce manufacturing costs and improve products.

As a result of such work company executives say: "Numerical control is here to stay. Not as an exotic bit of black magic but a logical and evolutionary development of manufacturing technology.

"To tape or not depends entirely on the nature of the job."

Multi-Spindle Unit Machines Pistons

CHUCKING UNIT: T. Laurence Strimple, president, The National Acme Co., with high production, multi-spindle unit used in machining pistons.

MEN IN METALWORKING

M. R. Anderson, elected vice president, Ex-Cell-O Corp.

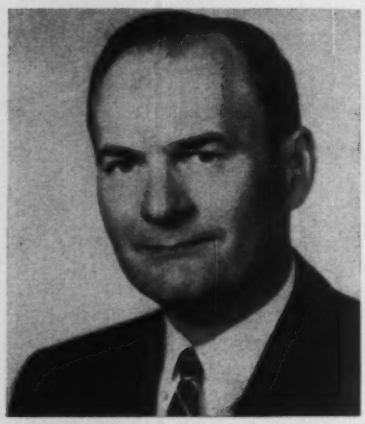
American Steel Foundries—J. R. Drever, named president, research lab.

Pennsylvania Utilities - Railroad Area Development Assn. — E. J. Smith, Jr., elected president.

Engineers Joint Council — Dr. E. A. Walker, elected president.

United Air Lines—Jack Misselhorn, named asst. to senior vice president, sales and advertising.

National Steel Corp.—L. A. Fugassi, named asst. vice president, engineering.



R. A. Lubker, elected vice president, research and development, Alan Wood Steel Co.

Kaiser Steel Corp.—B. N. Dagan and G. E. Balsley, elected vice presidents.

Bendix Corp. — A. C. Omberg, elected vice president.

Union Carbide Corp. — J. F. Shanklin, elected vice president.

Ford Motor Co.—J. W. Ford, named director, economics office.

Wickes Corp. — Smith Bolton, named vice president, operations.

Holtzer-Cabot Corp. — L. C. Schmidt, appointed vice president, manufacturing.

Canton Malleable Iron Co.—D. L. Mains, appointed vice president and general manager.

American Institute of Steel Construction — H. G. Lewis, elected president, J. K. Edmonds, elected executive vice president.

Basic Inc.—G. J. Peer, elected vice president, sales.

Metal Blast, Inc.—Philip Kaufman, named vice president, sales and engineering.

Norton International Inc.—W. G. Fallon, Jr., appointed vice president and general manager.

LeTourneau-Westinghouse Co.—C. B. Seelig, named vice president, marketing.

Alfred Heller Heat Treating Co.—Milton Margolis, appointed vice president and general manager.

Borg-Warner International Corp.—J. M. Gartner, elected vice president, operations.

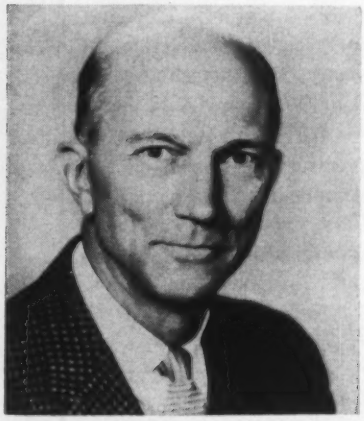
Gar Wood Industries, Inc. — R. A. Olen, elected director and executive vice president.

American Brake Shoe Co.—T. W. Russell, Jr., named president and director, Dominion Brake Shoe Co., Ltd., a subsidiary.

(Continued on P. 50)

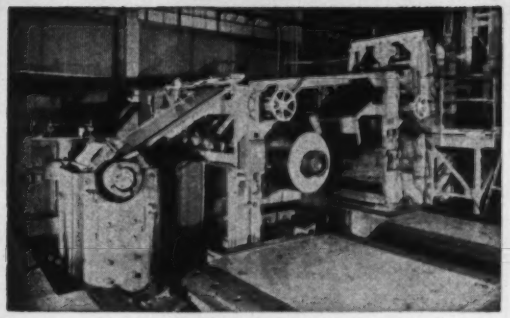
S. A. Ott, elected vice president in charge of operations, Colorado Fuel & Iron Corp.

William Brill, elected vice president in charge of engineering, Colorado Fuel & Iron Corp.



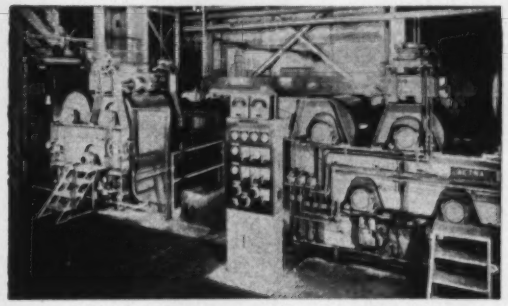
A. J. Scheel, appointed general superintendent, National Tube Div. Lorain Works, United States Steel Corp.

Continuous Annealing and Surface Treatment Lines have a lot in common

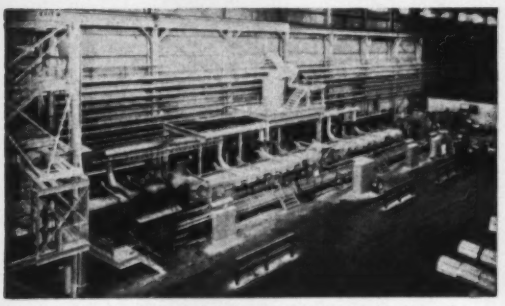


Delivery end shows recoiling.

Entry Section with uncoiling and scrap handling.



Multiple Bridle Rolls help maintain constant tension.



Strip Cleaning (horizontal) includes scrubbers and cleaning tanks.

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Aetna-Standard Division

BLAW-KNOX

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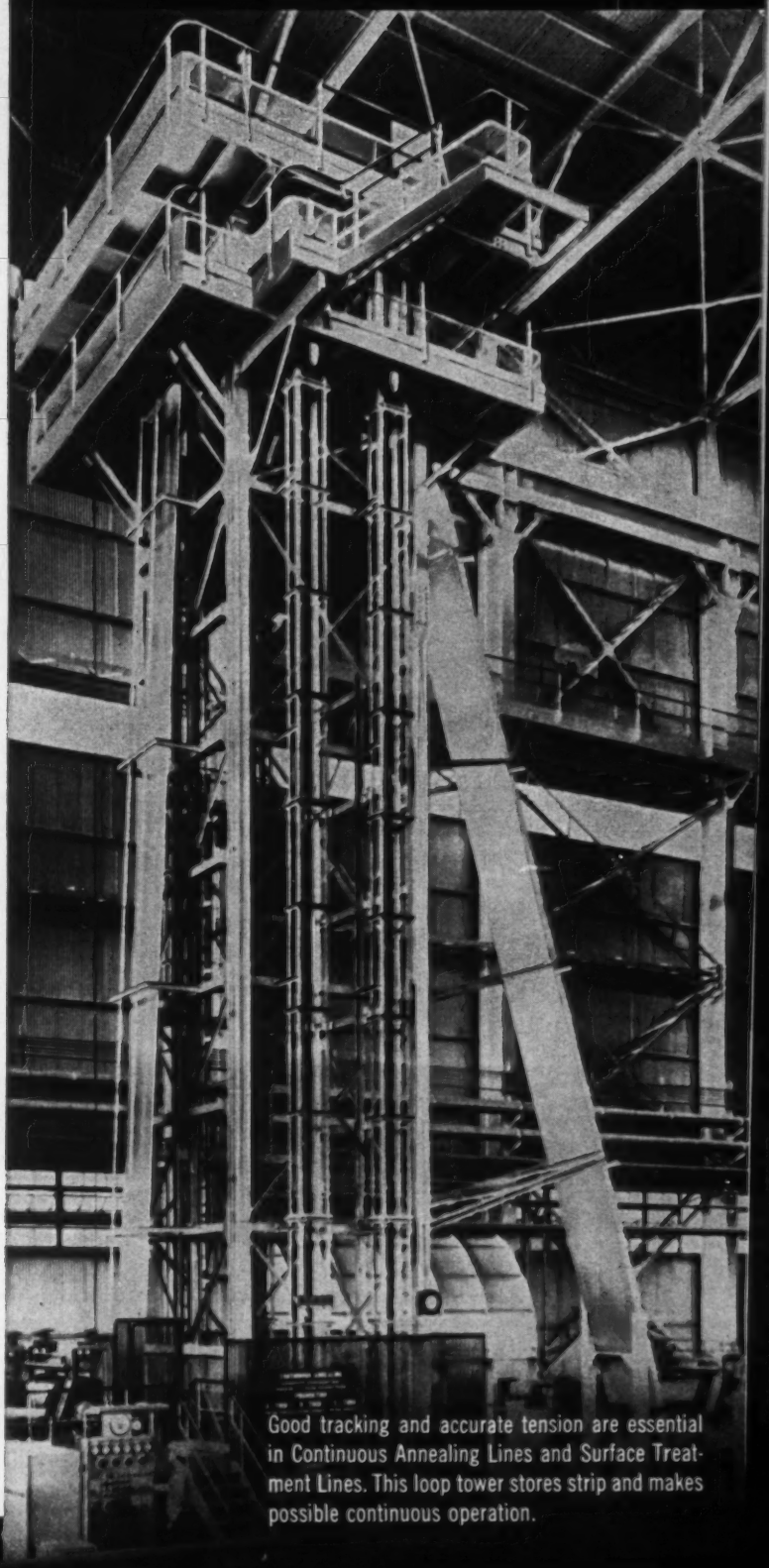
Blaw-Knox designs and manufactures for America's growth industries: METALS: Rolling Mills • Steel Processing Lines • Rolls • Castings • Open Hearth Specialties • PROCESSING: Process Design, Engineering and Plant Construction Services • Process Equipment and Pressure Piping • CONSTRUCTION: Concrete and Bituminous Paving Machines • Concrete Batching Plants and Forms Gratings • AEROSPACE: Fixed and Steerable Antennas • Radio Telescopes Towers and Special Structures • POWER: Power Plant Specialties and Valves



Good tracking and accurate tension are essential in Continuous Annealing Lines and Surface Treatment Lines. This loop tower stores strip and makes possible continuous operation.

(Continued from P. 48)

Moog Industries, Inc. — R. A. Dennis, appointed manufacturing asst. to the president.

E. J. Lavino & Co. — Andrew Leith, elected senior vice president.

Bethlehem Steel Co. — C. T. Stott, named asst. vice president Steel Div.; W. G. Smith, named general manager, Sparrows Point plant; R. S. Bennett, named general manager, Lackawanna plant.

Vanadium - Alloys Steel Co. — E. M. Sims, elected to board of directors.

Great Lakes Steel Corp.—Ross Wilkins, Jr., named vice president, customer services.

American Institute of Chemical Engineers — Dr. J. J. McKetta, elected president.

American Motors Corp.— R. D. Chapin, Jr., elected president, American Motors Export Corp.; W. S. Pickett and G. T. Etheridge, elected executive vice presidents.

United Engineering Trustees, Inc. —J. F. Fairman, elected president; C. H. Linder, elected vice president.

Caster & Floor Truck Manufacturers' Assn.—D. F. Adams, elected president; R. D. Mount, elected vice president.

National Warm Air Heating & Air Conditioning Assn.—Don Winegardner, elected president; H. P. Mueller, Jr., elected first vice president.

Westinghouse Electric Corp.— N. R. Brown, named director of reliability, motor & gearing dept.

C. M. Mapes, elected vice president, Reynolds Metals Co.

Pioneer Engineering & Manufacturing Co.—W. P. Penny, elected executive vice president.

Pangborn Corp. — R. A. Wolf, Jr., named asst. to vice president, Vibratory Finishing Div.

Eastern Stainless Steel Corp.— E. H. Neill, named member of board of directors.

North American Aviation, Inc.— H. T. Mudd, elected director.

Lindberg Steel Treating Co.—M. J. Wilms, named sales manager.

Owatonna Tool Co.—M. D. Garrison, named district manager.

Veritron West, Inc.—C. J. Rawson, appointed plant manager.

FMC Corp. — N. C. Olson, named district manager, Peerless Pump, Hydrodynamics Div.

Cooper-Bessemer Corp. — B. G. Nicks, named supervisor, planning; K. A. Rhoades, named parts marketing manager. Both of Parts Dept.

Paul Murphy, elected vice president, Reynolds Metals Co.

A. H. Williams, elected vice president, Reynolds Metals Co.

Dytronics, Inc. — W. L. Neal, appointed product manager.

Stranahan Foil Co.—T. N. Peck, named sales manager.

Temescal Metallurgical Corp.— W. N. Kiely, named sales manager.

Allied Electronics Corp. — George Seykoski, Herman Baron, and Ronald Kramer, named product managers.

Jones & Laughlin Steel Corp.— W. J. Livitski, appointed asst. director, construction & maintenance, central operations.

Hyster Co.—D. L. Sutter, named office manager.

Anadite, Inc.—Conner Bachman, appointed asst. general manager, California Div.; Charles Kish, appointed plant manager for all South Gate operations.

LINDE ELECTRIC WELDING
PLASMARC
NEW...THIN, FUSED DEPOSITS WITH CONTROLLED DILUTION
NEW...HIGH-SPEED, DROSS-FREE CUTS IN 5-IN. METALS
FOR MORE DETAILS...SEE PAGE 56 OF THIS ISSUE

FUEL FOR THE JETS OF O'HARE

Two 20-foot two-leg bridle slings of 1⅛" 6 x 19 Yellow Strand handle these tanks.

S. J. Reynolds Co. brings the Jet Age to O'Hare Field on Yellow Strand Slings

It took 21 stratalite jet fuel tanks, each holding 50,000 gallons, to slake the thirst of the big planes of the new air age at O'Hare Field, Chicago. The S. J. Reynolds Company of Cicero, Illinois, called on Yellow Strand safety slings to carry the burden of placing the 27-ton tanks in position. The reason – dependability. Yellow Strand slings are modern as the jet age – made better, built stronger to keep pace with modern needs. Whatever your sling need, call your Yellow Strand representative.

Yellow Strand®
BRAIDED SAFETY SLINGS

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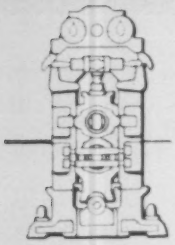
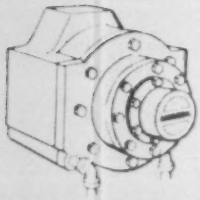
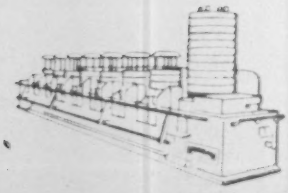


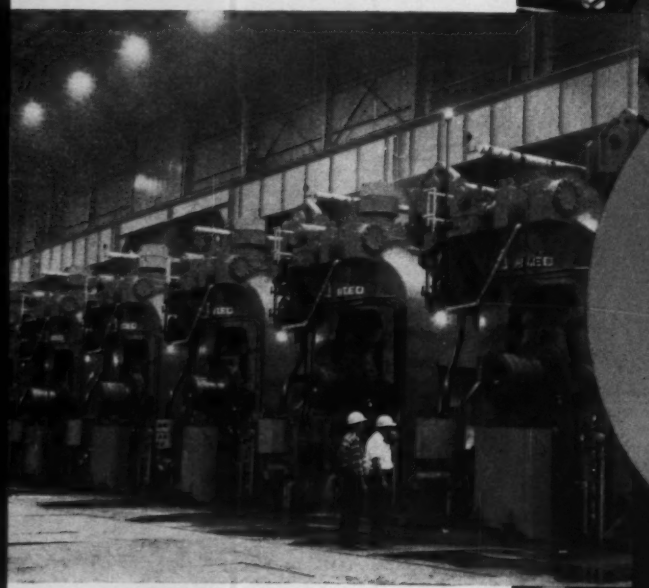
ROLLING MILLS



MORGOIL BEARINGS



WIRE DRAWING MACHINES



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COMBUSTION CONTROL

the
newest
development
in hot strip
mill design...

GREAT LAKES STEEL

DIVISION OF NATIONAL STEEL CORPORATION

PROVEN PERFORMANCE

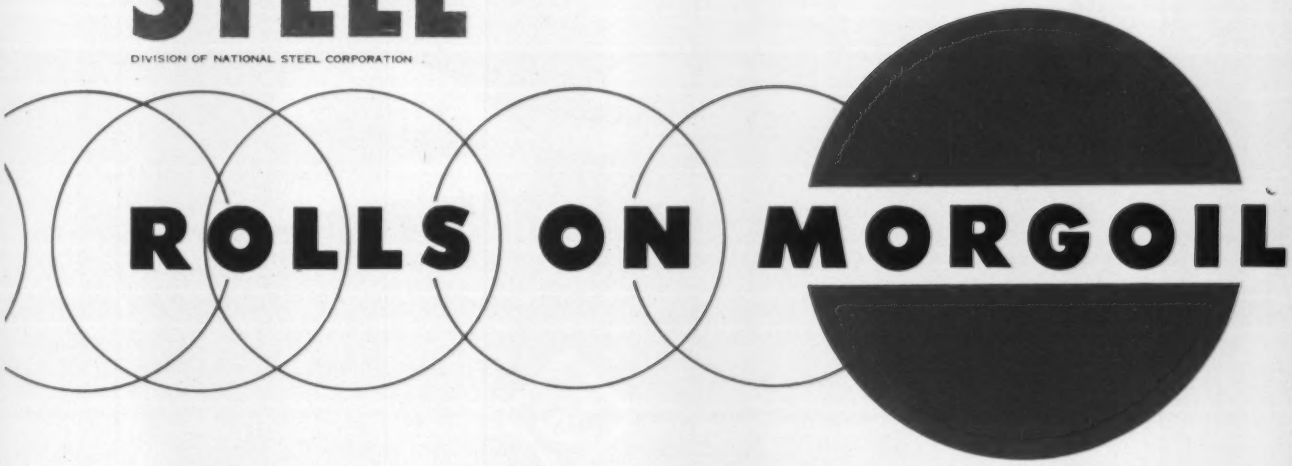
28 modern hot strip mills equipped with Morgoil Bearings since 1955 prove the soundness of Morgoil characteristics for meeting all requirements of hot strip rolling.

PRECISE STRIP

Mill stiffness is essential to precision gage control. Morgoil inherent design superiorities of unqualified capacity, high roll neck strength and chock rigidity create the stiffest possible mill without sacrificing bearing life or backup roll turndown.

LOWER COSTS

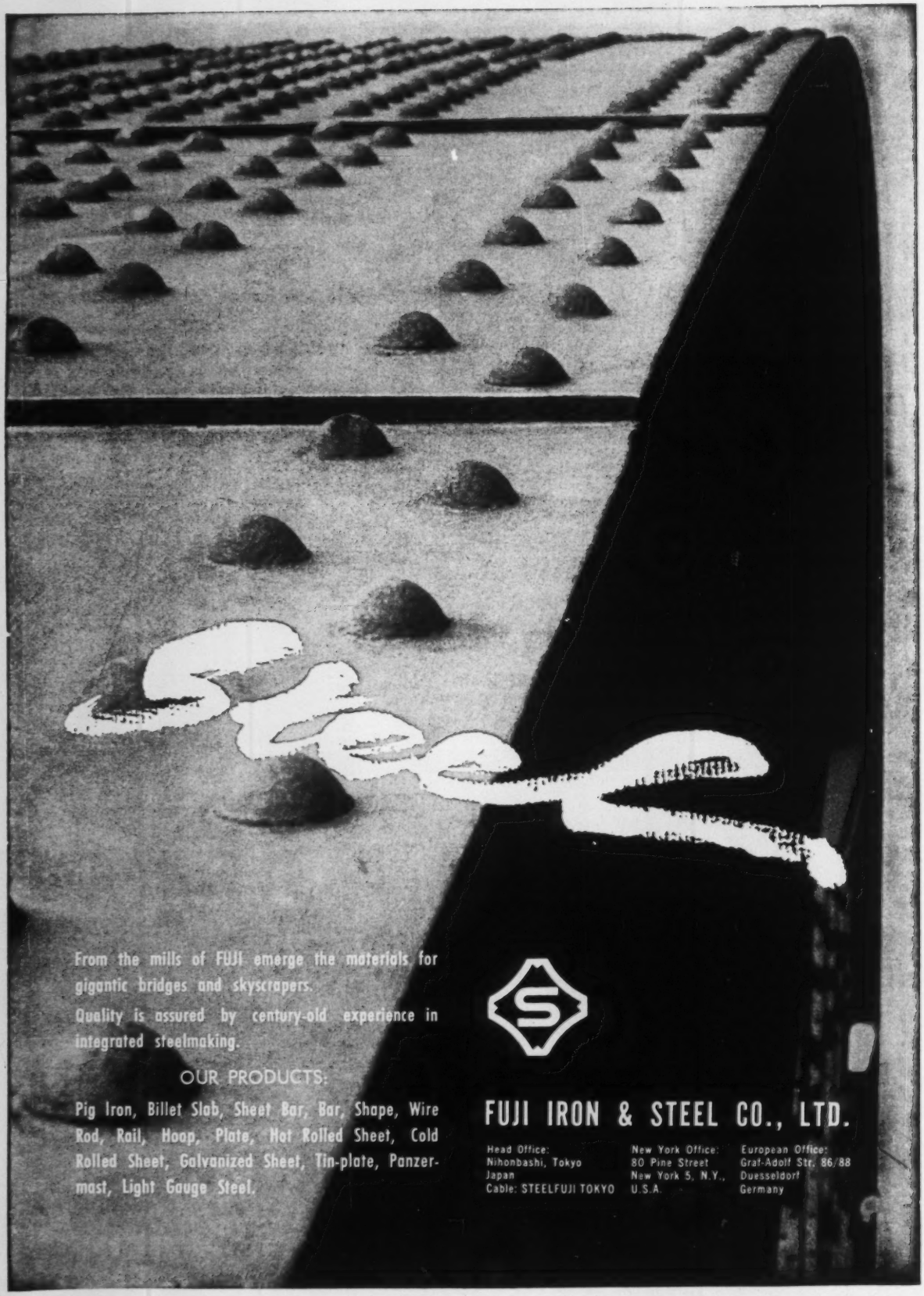
Lower over-all operating costs are a significant long-term Morgoil advantage. Lower initial costs constitute an additional sizable saving on each Morgoil installation.



OVER 19,000 MORGOIL BEARINGS NOW SERVING THE WORLD'S ROLLING MILLS

MORGAN WORCESTER

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS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Quality is assured by century-old experience in integrated steelmaking.
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Plate-Steel Skin for B-70

Said to be the first plate-steel skin for an airplane fuselage has been produced for the B-70 supersonic bomber. Rolled by Lukens Steel Co., the Armco Ph-15-7 Mo stainless steel plates are reported to be the widest and lightest ever made.

ROLLED PLATE: Gets a thickness check.

Twelve large plates measuring 30 ft 4 in. long, 10½ ft wide and 0.188-in. thick will be used in the fuselage. Four other sections will form the craft's 13-ft tall vertical stabilizer.

New Heat-Transfer Gage

Developed at a major midwest research lab, a heat transfer gage is logging new data on heating during re-entry of space vehicles. It is discovering the exact natures of plasma and effect on fast moving objects in the upper atmosphere. These studies have great significance for future materials and design. It's been learned already that ionized gases add up to two times greater effect than had been previously calculated.

Which Steels To Use?

Which high-strength steels are best suited for solid-propellant rocket cases? A report just released by the Defense Metals Information Center describes the evolution of new steels and their relationship to the more familiar types. The report will help classify the many trade-named steels into logical job categories.

Graphite's Bold Advances

Through improvements in the technology of its manufacture, graphite is now considered a promising Space Age material. It has unusual mechanical/thermal characteristics. It's stronger at high temperatures than any other known material. In fact, it gains strength as it gets hot. The machineable material also has a superior resistance to thermal cycling. This means it can withstand the shock of sudden temperature changes as might be experienced during the re-entry of a nosecone.

NASA Plans Two-Man Flight

NASA plans to go ahead with development of an orbital rendezvous as a means of reaching the moon. The Agency reports it will develop a two-man space ship capable of joining another in orbit. The two ships would be launched separately, meet in orbit, and then go on to the moon. The project, to cost $500 million, would use enlarged versions of the one-man Mercury capsule.

Big Booster Under Study

Two million to 24-million lb of thrust—that's the power range being studied by Aerojet General's liquid rocket experts. A booster with a 24-million lb kicker could land a 65-ton payload on the moon. That's enough to get several people there with the equipment to bring them back.

X-15 Ready for More Work

The X-15, having met all its design requirements this year, could easily exceed some of them in 1962. It's felt that the ship could climb to 400,000 ft—though it may never get the call. The three constructed are holding up so well, that's it's now expected they will outlive the life of the planned program. One report claims the craft will carry a number of experiments into space at heights greater than those obtained by balloons, yet lower than satellites.

New Fight for Satellite

One of the biggest satellite battles of 1962 will be fought in Congress, not in space. Congressmen are predicting that a new Administration plan for public ownership of space communications system faces a rocky road. The new plan, if approved by President Kennedy, would be put before Congress. It's an alternative to the FCC's proposal to limit ownership to international communications companies.

LINDE ELECTRIC WELDING

PLASMARC

New...very-thin, fused deposits with controlled dilution
New...high-speed, dross-free cuts in 5-in. thick metals

LINDE, inventor of plasma arc processes, announces *new* PLASMARC weld surfacing and *advanced* PLASMARC cutting. What is plasma arc? It is a flow of gas forced through an electric arc, constricted in a small-bore torch nozzle, and accelerated to form an intense jet. It combines electrical heat with the latent heat of highly-excited ionized gas atoms to reach one of the highest known metal-working temperatures (30,000° F.). It will melt any known metal.

A TRUE WELD

PLASMARC *weld surfacing* is true welding—not coating or plating—achieved by feeding powdered metal through the plasma arc into a weld puddle which freezes to form the deposit. Its precision eliminates excess buildup—ideal for such parts as valves, plowshares, seals . . .

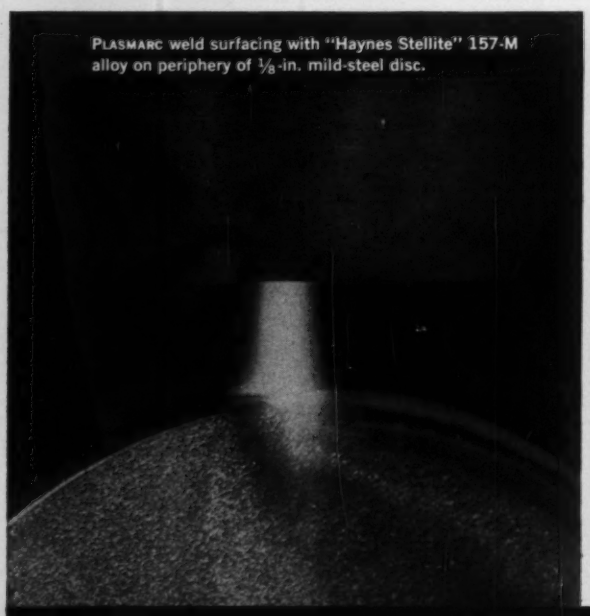
PLASMARC weld surfacing gives precise control of penetration of overlay metal into base metal—as little as .005 in. or higher. Gives precise control of dilution with base metal—from 5% up to 50%. Provides one-pass deposits as thin as .010 in., as thick as 3/16 in., with a wide range of metals and alloys. Produces widths from ⅛ in. to 1 in. or more, speeds over 20 ipm at 95% deposition efficiency, flatter and smoother deposits than other fusion processes.

4000 FT./SEC. VELOCITY

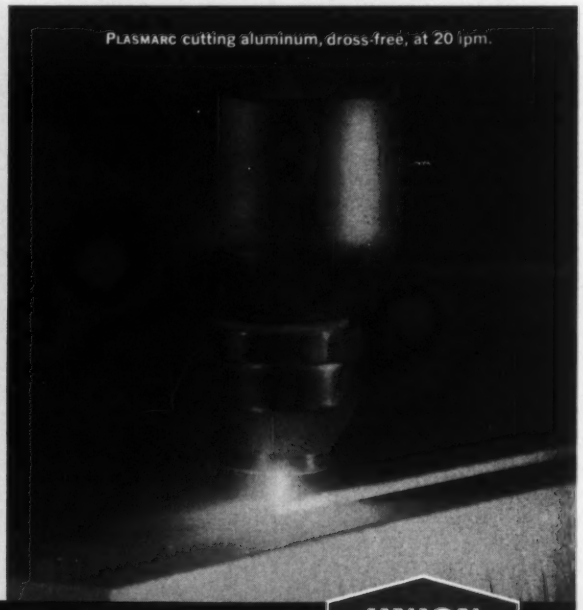
PLASMARC *cutting* uses a near-sonic velocity plasma jet (4000 ft./sec.). It easily melts-and-forces a narrow kerf through both ferrous and non-ferrous metals with little or no change in metallurgical properties. After six years' success, it is replacing shearing, sawing and powder cutting—slower methods which often require machining of the cut edge.

PLASMARC cutting has been further developed—heavy-duty equipment, higher current capacity—to handle increased metal thicknesses. It cuts aluminum, magnesium and copper up to 5-in. thick and stainless steel up to 2 in. thick, dross-free. It clean-cuts 4-in. thick stainless, nickel, carbon steel (requires no iron powder), "Monel," "Inconel," cast iron, high-alloy and clad steels. It makes precise, high-speed cuts up to 300 ipm, holds tolerances to 1/16 in., leaves a heat band as thin as .006-in. wide.

Get full details . . . see a "live" PLASMARC demonstration. Contact your local LINDE office or write direct.



PLASMARC weld surfacing with "Haynes Stellite" 157-M alloy on periphery of ⅛-in. mild-steel disc.



PLASMARC cutting aluminum, dross-free, at 20 ipm.

LINDE COMPANY
Division of Union Carbide Corporation
270 Park Avenue, New York 17, N. Y.

UNION CARBIDE

ENGINEERING TEAM: A. M. Impagliazzo, engineering manager and C. H. Diehl, manager of R & D, C. H. Wheeler Manufacturing Co., discuss results of pump bearing and journal tests on carbide materials.

Carbide Bearings and Journals Lengthen Pump Life

By **C. H. Diehl**—Director of R & D, C. H. Wheeler Manufacturing Co., Philadelphia

Pumps are facing increasingly tough operating conditions.

A three-year test program points up how carbides are solving wear problems in bearings and journals.

■ The problem of steadily extended pumping limits, heavier bearing loads and increased surface speeds calls for a more durable combination of bearing-journal materials.

To solve this problem, the research and development department of C. H. Wheeler Manufacturing Co., Philadelphia, began a series of tests three years ago with hundreds of different combinations of bearing and journal materials. The tests simulated actual field usage.

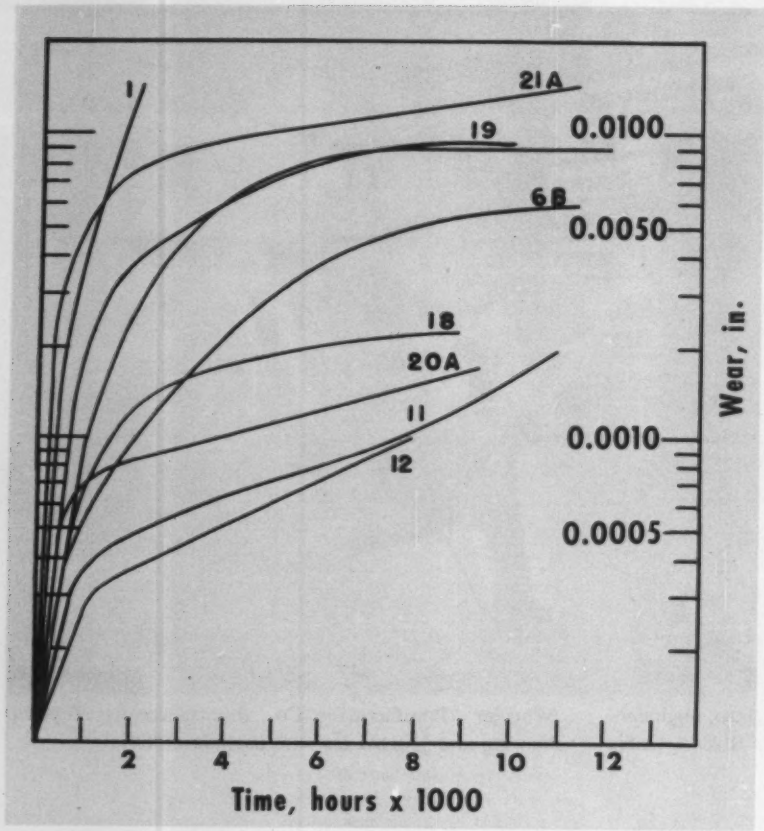
The findings: Water-lubricated bearings and journals made of carbides gave the best results as compared to other combinations of metals, rubber, plastics, and cermets.

Why Journals Fail—Why do bearing journals fail? Depending on: Type of job; foreign matter in the water; bearing-journal material and bearing loading; undesirable effects to bearings and journal may range from a high rate of wear to seizure or galling.

In addition to wear caused by suspended foreign matter, hydraulic and dynamic unbalance of the pump's shaft and impeller are also major causes of vibration and wear. These hazards may lead to equipment jamming, or excessive downtime for maintenance and parts replacement.

A high load-carrying capacity is

Check Carbide Test Data



Results Reveal Low Wear Rates

TEST RESULTS

TEST NO.	BEARING MATERIAL	JOURNAL MATERIAL	WEAR, in.	WEAR RATE, in./hour x 10^{-7}	TOTAL HOURS
10000 HRS					
11	Carbide	CHR-OX	.0017	1.6	10274
12	Carbide	Carbide	.0020	1.8	11226
6B	Bronze	Carbide	.0061	5.3	11514
19	Carbide	Carbide	.0090	7.8	11606
10	Bronze	Carbide	.0092	9.1	10130
21A	Carbide	Carbide	.0144	12.7	11334
8000 HRS					
20A	Carbide	Carbide	.0017	1.9	8963
18	Carbide	Carbide	.0023	2.7	8793
6000 HRS					
15C	Carbide	Carbide	.0008	1.0	7758
3E	Carbon	XH-SS	.0018	2.5	7272
8A	Bronze	Carbide	.0032	4.2	7649
4000 HRS					
5E	Carbide	Carbide	.0007	1.2	5945
1D	Carbide	Carbide	.0018	3.6	5038
9D	Carbon	HD Face	.0020	4.2	4693
4D	Carbide	Carbide	.0018	4.5	4025
8	Carbon	Carbide	.0048	11.3	4167
17E	TFE	HD Face	.0140	19.5	4489

an important trait needed for a good bearing. The factory PV (Projected area of loading, psi x Surface rubbing speed, fpm) is usually used to evaluate the capacities of various types of materials as sleeve bearings.

High PV Factor—In machinery applications, sleeve bearings are usually designed for not more than 30,000 PV; in some pumps, however, a range of 40,000 PV is possible. This series of tests was made at a 40,000 PV factor.

To accurately determine the wearing extent of various candidate materials, a test apparatus representing the "tail section" of a condenser-circulating pump was designed to duplicate actual operating conditions.

For test purposes, a commercial ⅞-in. bearing size was chosen. Bearings of this size can provide easily discernible results. Surface speeds for the tests were higher than normal but were not that high so as to produce side effects. Before installation in the test apparatus, all bearings and journals were precision gaged at 90°F.

One-Half Horse—Each of the 24 testing machines—operated simultaneously and continuously, and clocked by running time meters—was driven by a one-half horsepower, 3450-rpm motor connected by a flexible coupling to the pump shaft.

Torque output was 12.2 oz-ft allowing for bearing friction, this output permits a maximum limit of 0.33 for the friction coefficient of the bearing - journal combination. This value is considered as maximum for the least desirable operating conditions.

Few Pass Test—Of 128 combinations of materials tested, only 17 passed the 4000 hours of operation —14 of which used carbides as either the bearing or journal material, or both. All the carbide combinations are still being tested and have logged more than 15,000 hours of operation.

Results show that the carbides

have two vital features for sleeve-bearing operations under adverse lubrication conditions: Exceptional hardness; and non-material transfer.

Attesting to the hardness and abrasive resistance of carbides was a test in which the water contained a beach sand. The sand was ground to a fine powder after 54 hours of operation. Yet, the carbide bearing and journal used in this test showed only 0.010 in. total wear.

Carbides Hold Up—While other tested materials expired in less than 2000 hours, the carbides were just being broken in.

The less costly team of a bronze bearing and a carbide journal also gave good results. The non-galling trait of carbide and bronze offers a bearing-journal combination that serves well in standard systems pumping clean water.

Various combinations of metals, commonly used on heavily-loaded bearings, were also tested. Included were tests on eight types of bronzes mated with various materials. In addition, several high-nickel-content alloys, hard facing overlays and lead-lined bushings were tested.

Gives Top Results — Of these metals, a bronze bearing, containing finely-dispersed particles of spheroidized lead mated with a journal of stainless steel, gave the best results.

This test ran about 2000 hours; wearing characteristics were relatively good. An unusual feature is the thin non-galling film that the lead provides and continually replaces on the bearing surface as soon as it wears away. Tests on this combination are being continued.

Sintered bronze materials in combination with stainless steel were tested. Performance is satisfactory as long as the impregnated lubricant remains in the bearing.

Test Plastics Also—A number of plastics were given 30 tests. Some of these materials were reinforced with glass fiber; others were filled with additives. In 17 of these experiments plastic bearings, mated with stainless steel journals, failed.

The most notable cause of failure is the buildup of frictional heat which melts the surface of the bearings. Plastics also performed poorly when reinforced with glass fibers or fill materials because of the abrasive effect of the additives.

In combination with eight different types of shafting, standard rubber bearings commonly used in water-lubricated pumps were tested. Although the rubber bearings showed little wear, the journals were worn by abrasion.

The abrasive effect on the shaft can be traced in part to the vertical grooves in this type of commercial bearing in which foreign matter from the water can lodge.

Of the several types of ceramics tested, all showed poor wearing traits and were abraded on all mating materials.

Replace Other Materials — Results with carbides were so favorable that carbide bearings and journals have been used to replace worn bearing-journal assemblies of other materials in some power station pumps.

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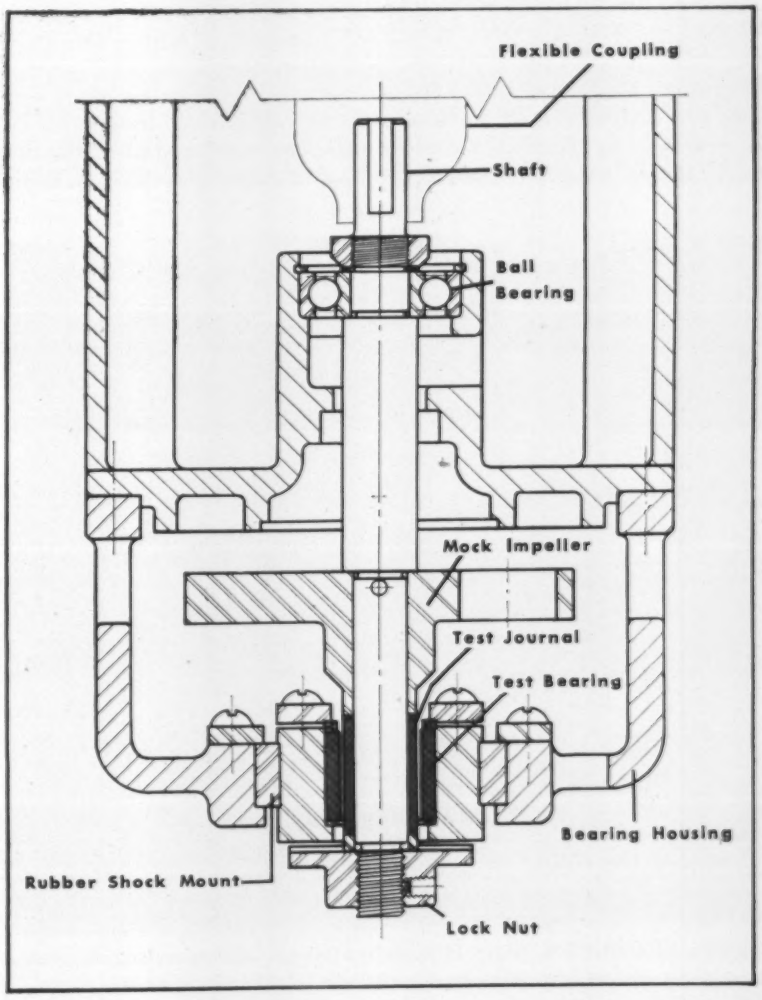
How Slowly Do Carbides Wear?



Integrated Tooling Automates Drilling of Printed Circuits

Working from an engineering print, a semi-skilled worker punches a tape that controls a multispindle drill press.

After the tape programs all spindle setups, it dictates complete drilling instructions.

▪ Printed-circuit boards are getting more and more complex. The average board contains 200 holes for mounting electrical components.

A novel concept for automatically locating and drilling these component-mounting holes has been translated into production equipment. This new equipment is the result of joint efforts by General Electric Co.'s Heavy Military Electronics Dept., Syracuse, and the Edlund Machinery Co., a division of Harsco Corp., Cortland, N. Y.

C. B. Hoag, manufacturing-engineering manager at the GE plant, states: "This equipment is the first of its kind. It opens the door to low-cost automation for short work runs on complex wiring boards."

Production Payoff — Mr. Hoag adds: "The automatic unit eliminates separate planning, programming, data-processing and drilling set-up stages. Previously, these operations made the use of automated equipment too costly for short runs."

Here's another feature of the new drilling equipment. It permits machine-controlled production, directly from a scaled drawing. A semi-skilled worker controls output levels right on the shop floor.

In essence, the automatic printed-circuit drilling equipment consists of two main units. Each can be operated independently.

One unit is a drawing-to-tape convertor. It generates a completely programmed 1-in. wide 8-channel punched tape. Every tape is punched directly from a dimensionless drawing, outlined on a 0.1-in. grid pattern.

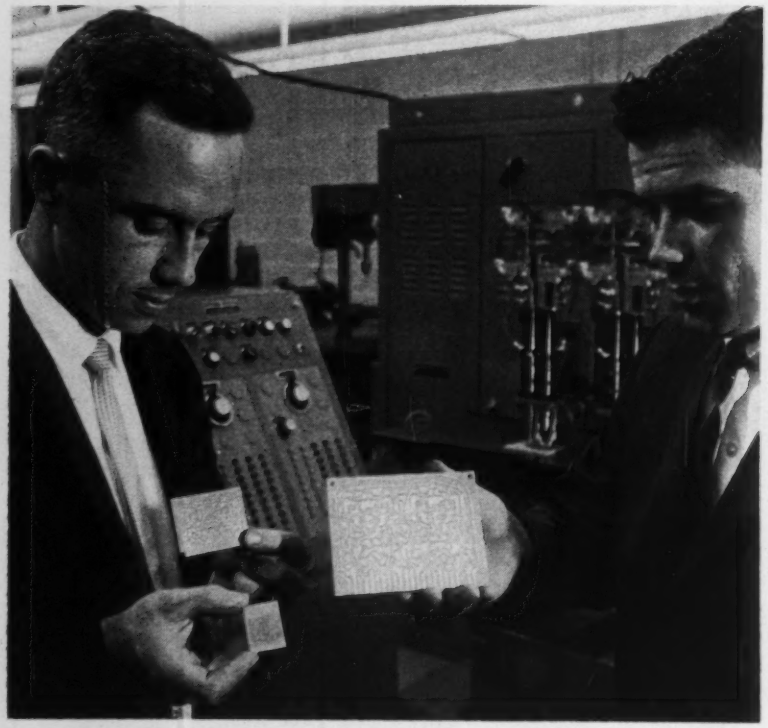
Drilling Unit — A 16-spindle, tape-controlled drill press serves as the second part of the new system. After the drill press reads a punched tape, it automatically drills stacks of printed-circuit boards.

Since the programmer is separate from the drilling machine, you can even prepare tapes while other circuit boards are being drilled. There are no delays due to costly manual tooling and lengthy setups.

Working directly from a one-to-one, two-to-one or four-to-one scale print, the operator activates a tape puncher. The tape is prepared as the operator positions an electromechanical stylus over the holes shown on the print.

Drawings that measure up to 24 x 24 in. can be handled. A single pushbutton actuates the stylus. Then, the X and Y coordinates of each hole—as well as the proper drilling commands—are transmitted to the punched tape.

Always Centered—In preparing a tape, all the operator does is position the stylus within +0.04 in. of a hole's center. A mechanical self-correcting device registers the true center of every mounting hole. End results include greater accuracy, more uniform printed-circuit boards and increased circuit reliability.



FINAL PRODUCTS: Harry Hill, (left), one of GE's manufacturing engineers, inspects finished printed-circuit board. Note various sizes.

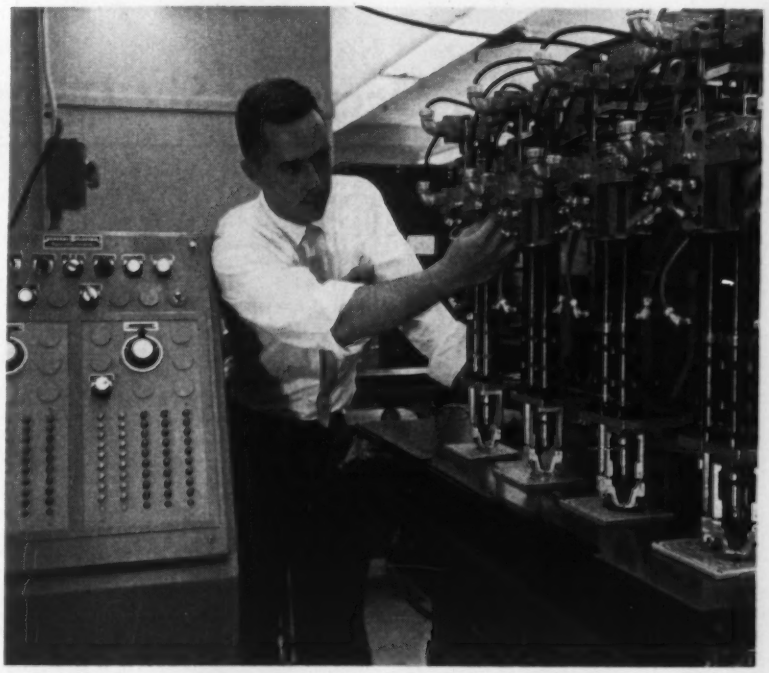
PREPARES TAPE: The drawing-to-tape converter handles prints up to 24 x 24 in. Using an automatic centering device, the operator transmits X and Y coordinates to the tape at a rate of 35-40 holes per minute.

Using the stylus, the operator programs a tape at a rate of 35-40 hole coordinates per minute. Coordinates as fine as 0.001 in. can be punched into the tape by employing a dial-in method. These precise coordinates aren't located on the 0.1-in. grid pattern.

Direct conversions from production prints to programmed tapes simplify engineering changes. This feature permits a high degree of product flexibility. And the punched tapes are easy to store.

The drilling machine has four stations. Each station has four drills, operating at spindle speeds up to 22,000 rpm. Table travel is 20 x 14 in. The 8-channel tape commands complete drilling of component-mounting holes at a rate of 54 finished holes per minute per board.

Once a tape has been prepared, an average of four stacks of boards are drilled in four minutes.



DRILLING STAGE: Numerical-positioning device commands all drilling operations. Each spindle can be set to drill a different-sized hole. While drilling takes place, the programmer can be used to prepare more tapes.

How to Block the Danger Zones Inside a Punching Press

By **Federico Strasser**—Consultant, Santiago, Chile

Today, punch operators don't have to reach into the press. But for some reason, they still lose a lot of fingers.

All of these injuries can be prevented. All you have to do is block six danger zones.

■ Pressworking is an old art. It began several centuries ago. However, only a few decades have passed since man finally got around to becoming safety-conscious.

Before the turn of the century, it was taken for granted that accidents always happen around presses. A press operator with only one finger missing was "born lucky."

The earliest safety devices were devised to treat the symptoms. Very few attempts were made to counteract the various danger sources.

Reach Fast—Most of these safety devices were tailored to protect an operator's hands when he reached into a press. Although they leave a lot to be desired, these crude devices still enjoy a certain degree of popularity.

Today, safety experts take another approach in preventing presswork accidents. This approach is two-pronged. First, with properly designed tooling, an operator doesn't need to place his hands inside the danger zones.

The second part of an effective press-safety program centers on the use of guards or blocking barriers. Mounted on the dies or the press itself, these guards prevent an operator from intentionally or inadvertently inserting his fingers in any danger area.

Where does safety begin in presswork operations? It should be a paramount factor in press-tool design stages.

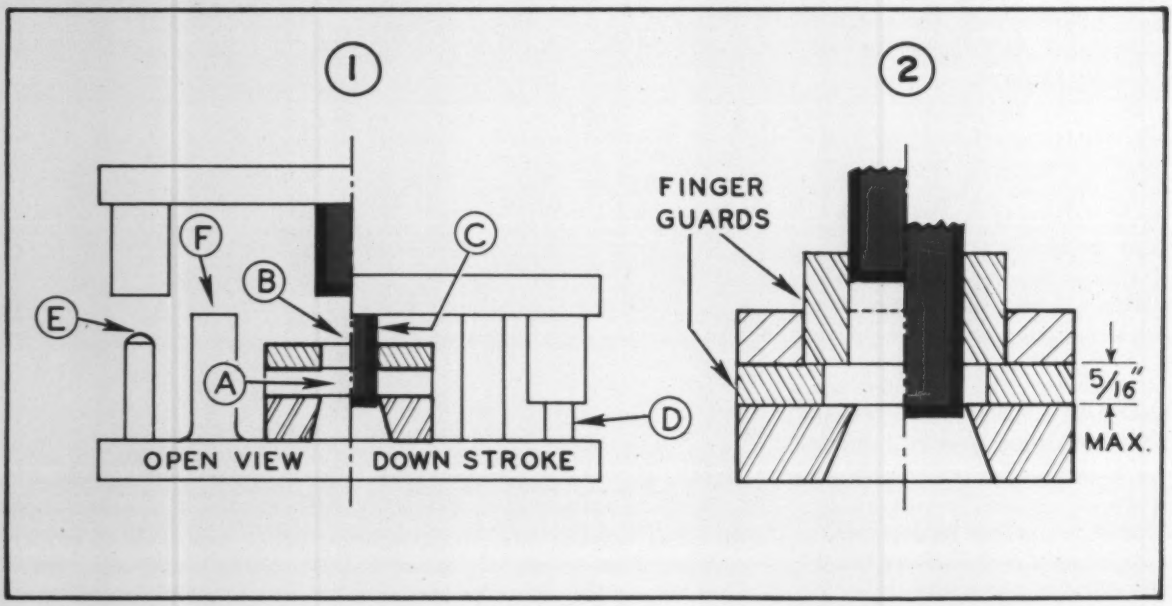
Use Sound Approach—Generally, you can divide most press tools into first- and second-operation dies. Your safety approach will differ to match the die design.

The simplest press tools, from a safety viewpoint, are first-operation dies. There's never any reason why an operator needs to reach into the interior of these tools. Nevertheless, you still must prevent an operator from getting his fingers crushed.

In terms of die anatomy, let's see where the actual danger zones exist. They're lettered on fig. 1. Area A is the danger zone between the punch and the die plate. This is one of the areas that punch-press operators fear.

Area B denotes the danger zone

Most Injuries Occur in Six Danger Zones



Simple Guards Protect Fingers

that's located between the punch and the stripper. Another danger zone, between the punch holder and the stripper, crops up in area C.

Other Danger Spots—Two more danger areas exist between parts of the die set. They're shown in zones D and E. The letter F depicts the last danger spot. It's the space between punch accessories.

Preference should always be given to dies with solid, stationary stripper plates. These "closed" dies are much safer than those with movable strippers.

Most accidents occur at the sides of the stripper plate, in zones A and B. Fig. 2 shows how simple finger guards prevent accidents in these common trouble spots.

You'll note the height of the canal where the strip moves between stripper plate, die plate and stock gages is less than 5/16 in. This means the operator can't get his fingers in this opening.

Leg Room — Sometimes stock-entry canals must be higher than 5/16 in. Let's see what can be done to protect an operator's fingers when such a case arises.

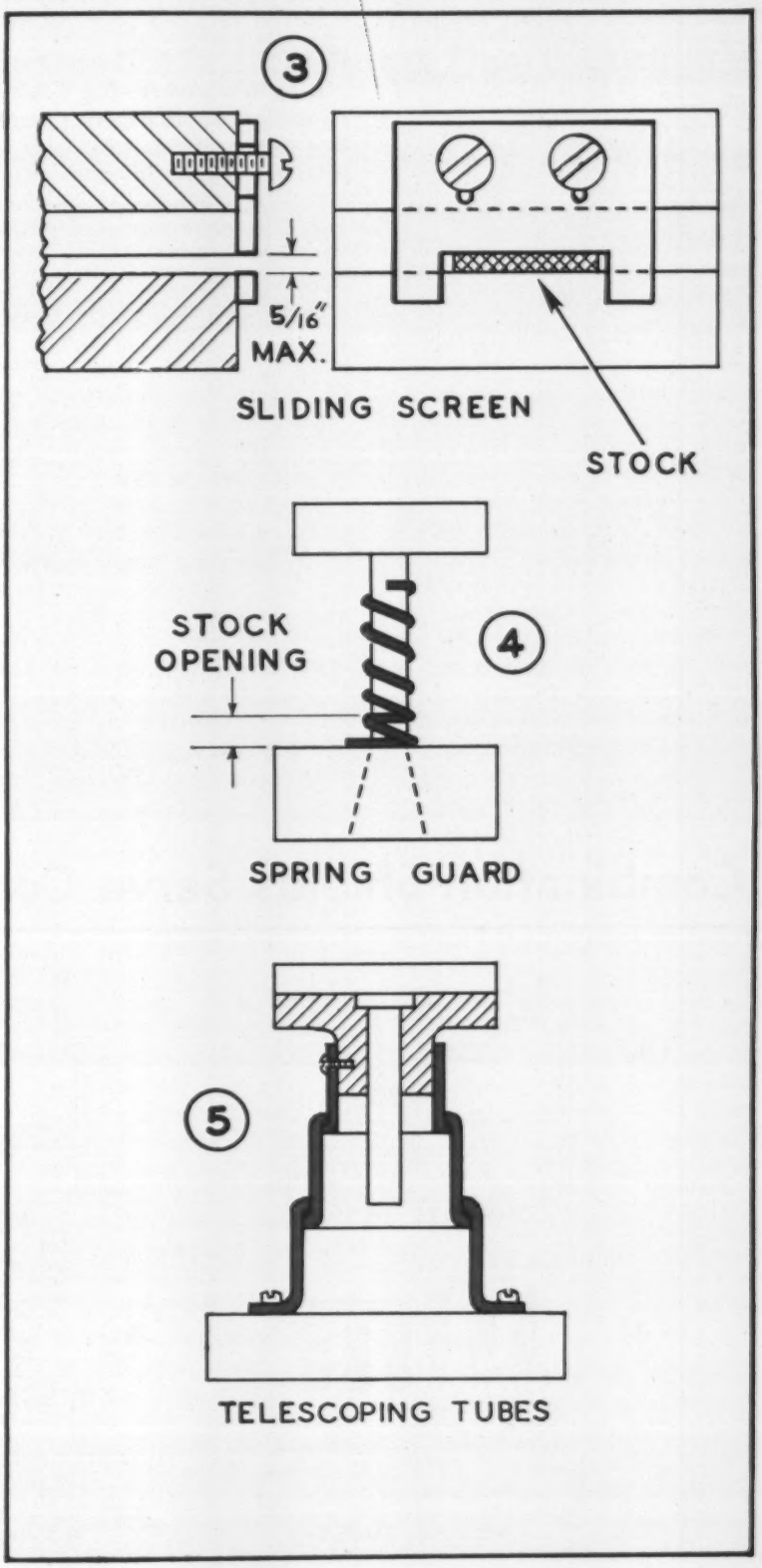
Fig. 3 shows a simple screen guard. When heavy-gage stock enters the punch area, the lightweight screen slides up to let the stock pass. Then it drops back to its original position. This prevents the operator from getting hurt.

Stock that's thinner than 5/16 in. passes through a cutout in the sliding screen. Thus the screen proves ideal for some special punching needs. It acts as a finger barrier in progressive dies where intermediate forming stations bend legs upward or downward.

Keep It Loose—Both holes in the screen must be elongated. Never tighten the screws that hold this screen in place. The sliding action has to remain free at all times.

In designing a punch die, the shortest practical ram stroke should be employed. With a short stroke, you can keep the punch from leaving the stripper. This means the stripper plate must be rather thick.

If special design factors prevent



you from using a thick stripper, you'll have to work around the problem. Extra-long ram strokes may mushroom the clearance between a punch and its stripper. This open area, zone B, must then be screened off.

The next two figures show two ways to block zone B. A spring guard, fig. 4, serves whenever the clearance area isn't too great. For longer ram strokes, telescoping tubes can be used as shown by fig. 5.

Wide Choice—Short pieces of pipe with flared-out ends yield sturdy telescoping-type guards. Leather "jackets," plastic bellows or rubber tubing may be used in lieu of these metal pipes.

To eliminate finger-crushing hazards between punch holders and stationary strippers, zone C, there are several measures which should be considered by tool designers.

Various combination guards prevent accidents in zones B and C. The last group of illustrations shows construction details for a few simple combination-barrier guards.

A one-piece or composite design appears as fig. 6. If the ram has overhanging shank-holder bolts, you should use a baffle plate with this guard. The baffle plate prevents the formation of a nib point between the guard and the bolts.

Long Ram Strokes—Fig. 7 shows a two-piece telescoping-wing guard. One section of this guard acts as stationary shield. It's attached to the fixed portion of the punching tool. The other part of this two-piece guard is fastened to the punch holder or ram.

If you must use long ram strokes in your punching applications, a two-piece wing guard may be just what you need. However, if you choose such a guard, don't forget to stamp maximum stroke values in an eye-catching spot.

Transparent materials which are shatter-proof can be used to construct the safety guard illustrated by fig. 7. Heavy-gage wire mesh may also be employed, if you don't have a dust problem.

For some production setups, telescoping-tube guards boast many advantages. The best arrangement, fig. 8, is obtained with stationary (full) rods and movable tubes. Dirt, dust and foreign matter can't get into these tubes and cause scoring or galling.

Movable Strippers—Many shops use movable strippers which are a attached to the punch holders. Special details must be considered in safeguarding these punching setups.

Whenever possible, keep the distance between the stripper plate's bottom and the die plate's top within 5/16 in. This will prevent trouble in danger zone A.

Quite often this condition can't be fulfilled because the ram stroke is too long. In the case of a long stroke, a stationary guard must be provided around the die plate. Fig. 9a illustrates this condition.

Fig. 9b depicts an effective guard that prevents injuries when the opening in a closed die is 1 in. or less. By combining designs 9a and 9b you can obtain a telescoping guard for movable strippers.

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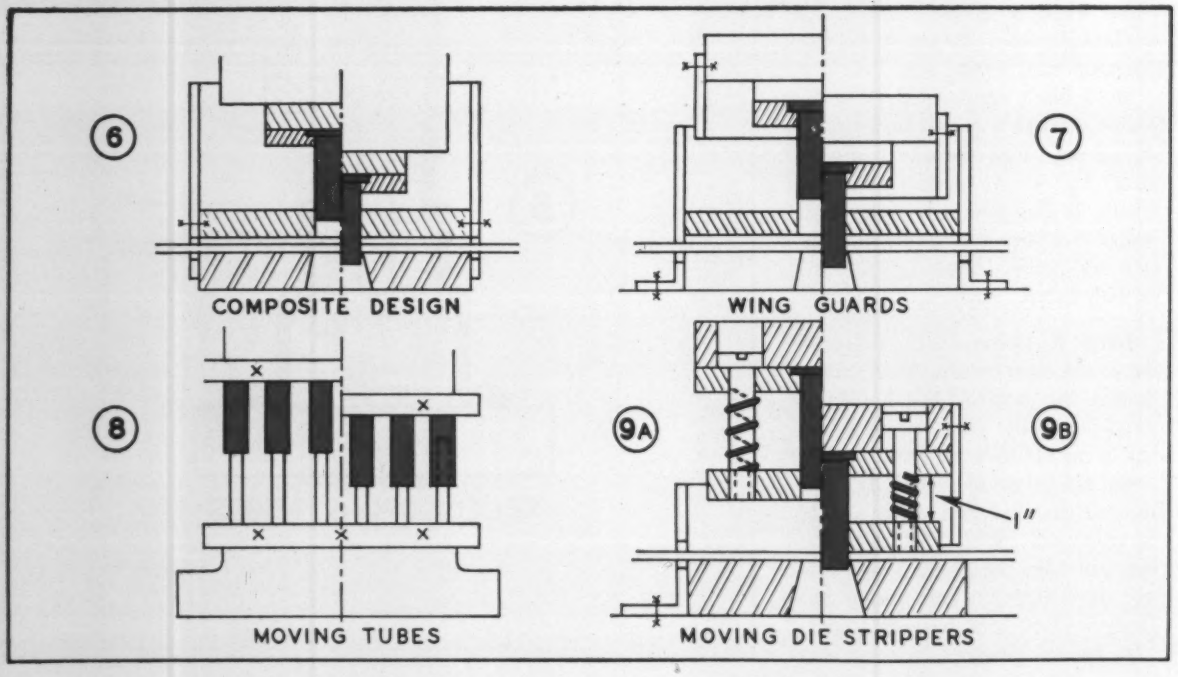
Combination Shields Serve Complex Setups



Warehouse Handles Bars Quickly

Special System Takes Its Orders From a Computer

Housing stainless steel bar and wire is a big chore. Getting the goods to market calls for quick distribution.

A highly-mobile handling system does the trick at one company's warehouse.

■ A new highly-mechanized stainless steel bar and wire warehousing and distribution facility is ready to serve industry. A spokesman for Armco Steel Corp., Middletown, Ohio, claims the new setup will increase bar shipping capacity by 50 pct.

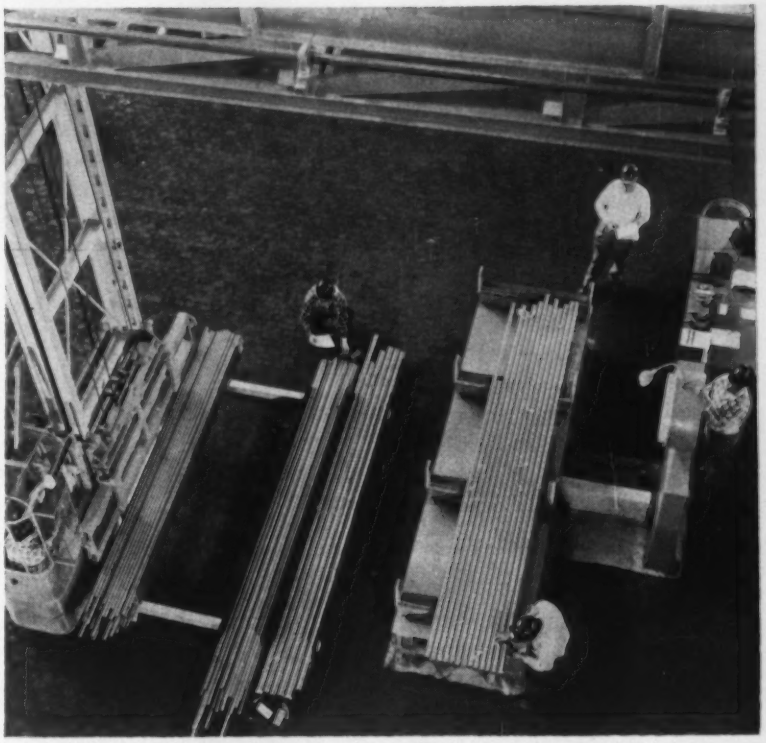
The heart of the facility is a mobile materials handling setup linked to an electronic ordering system. The integrated facility is capable of shipping 3000 tons of stainless steel bar products per month.

Fills a Need—"By increasing the amount of stainless steel that can be stored at any one time and cutting handling time, we expect to give immediate off-the-shelf service on an increasing number of orders," says M. B. Wilson, vice president, sales.

"Orders that can be filled within a single working shift amount to about 30 pct of all orders on a tonnage basis. This is true despite the fact that many stainless steel products we handle are so-called specialty items," he said.

The new 48,500-sq ft building houses warehouse space and bar processing equipment. The principal storage area for bar products consists of more than one-hundred 21-tier stacks. Each 1-ft deep tier holds a bar storage pan.

Pans Preferred—Armco's plant engineers find that holding bar products in pans is preferable to storing material loosely in racks. The pans increase portability and decrease material damage through rough handling. The 2500 pans used in the system store about 4000 tons of bar products.



QUICK CHECK: Material removed from the stack area by a 4-ton stacker crane is brought to the scale. Then the overhead cranes go to work.

Each pan is keyed to an inventory control program, designed to be switched to a computer system early in 1962. Plans call for integration of the presently used teletype with the computer. One tape will serve both units.

The stacking area, divided in half by a wide center aisle, is serviced by two 4-ton cranes. Orders are teletyped to the control center outside the stack area, processed, then delivered to the crane operators.

Covers Sector—The crane, which is able to pivot 180°, moves to the aisle, finds the designated stack and rises to the tier holding the right pan. After removing the pan, the crane moves by the shortest route to the weighing area. An overhead crane takes over at the weighing station. Another carts the material to the shipping area.

Two modern bar-turning machines have been installed to turn and finish bars where specified. The high-speed machines handle bars up to 4½-in. diam.

An increase in the number of stainless steel grades handled, coupled with a constant shift in customer demands, contribute to the need for an up-to-date supply system. Armco feels it has met this need with its system.

NBS Gages Corrosion Rates

Everyone knows metals corrode in soil. But corrosion rates are hard to measure — even harder to predict.

Results of recent tests show polarization techniques offer a practical measuring method.

■ The polarization method is well known in the lab. It's one way to pinpoint corrosion rates of ferrous metals exposed to soils and salt-water solutions. According to a recent National Bureau of Standards' study, this technique may also have practical field uses. The NBS has used it to determine corrosion rates in field-buried specimens.

Results Check Out—Based on cumulative weight loss, the corrosion rate was calculated from polarization measurements. Values derived in the present study show good agreement with the actual weight loss found after the exposure period. These results indicate the method may have practical value for estimating corrosion rates. Measuring soil corrosivity is another possibility.

W. J. Schwerdtfeger of the Bureau staff undertook this experiment to evaluate the polarization method for underground studies. Another goal was correlation of climatic variations with corrosion data.

In the study, a low-carbon steel and a high-purity aluminum served as test materials. Both test pieces were tubular with dimensions of 30.5-cm long x 4.75-cm diam. Rubber caps sealed the ends of the specimens, leaving 372 sq cm of surface for exposure to the soil.

Test Setup—Buried in 30-in. holes outside the corrosion lab, the specimens were spaced 3 ft apart in a vertical position. During the measurements, an auxiliary electrode served as either an anode or a cathode. It was buried 20 ft away. Rubber - insulated copper wires linked each specimen to the electrode. The wires were also connected to a two-pen recorder installed in the lab. This device recorded polarization data.

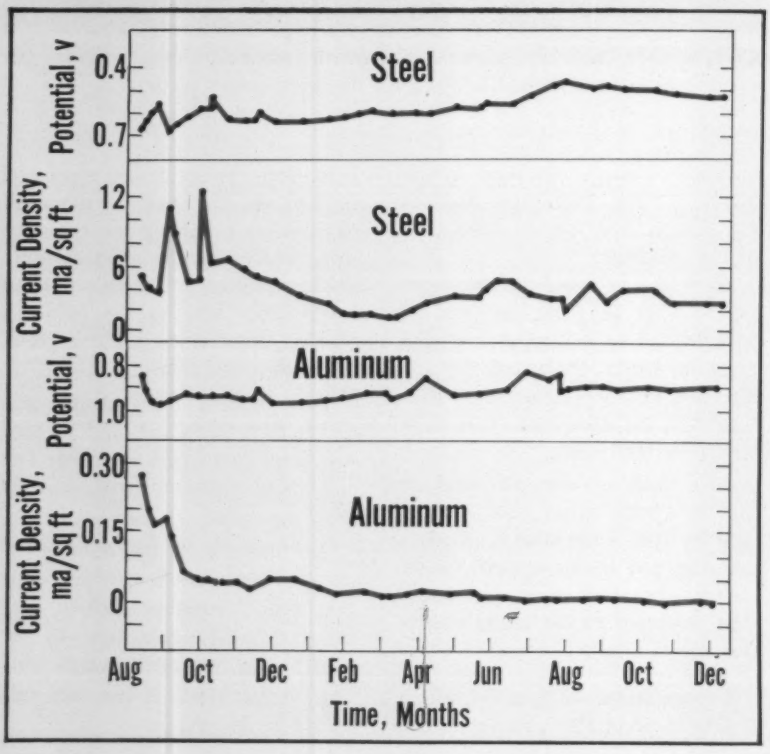
To get the polarization measurements, cathodic and anodic currents were periodically applied in increasing amounts to the corroding specimens. Weight loss over a specific time interval was calculated from the current values. These values coincide with changes in slope or breaks in the respective polarization curves.

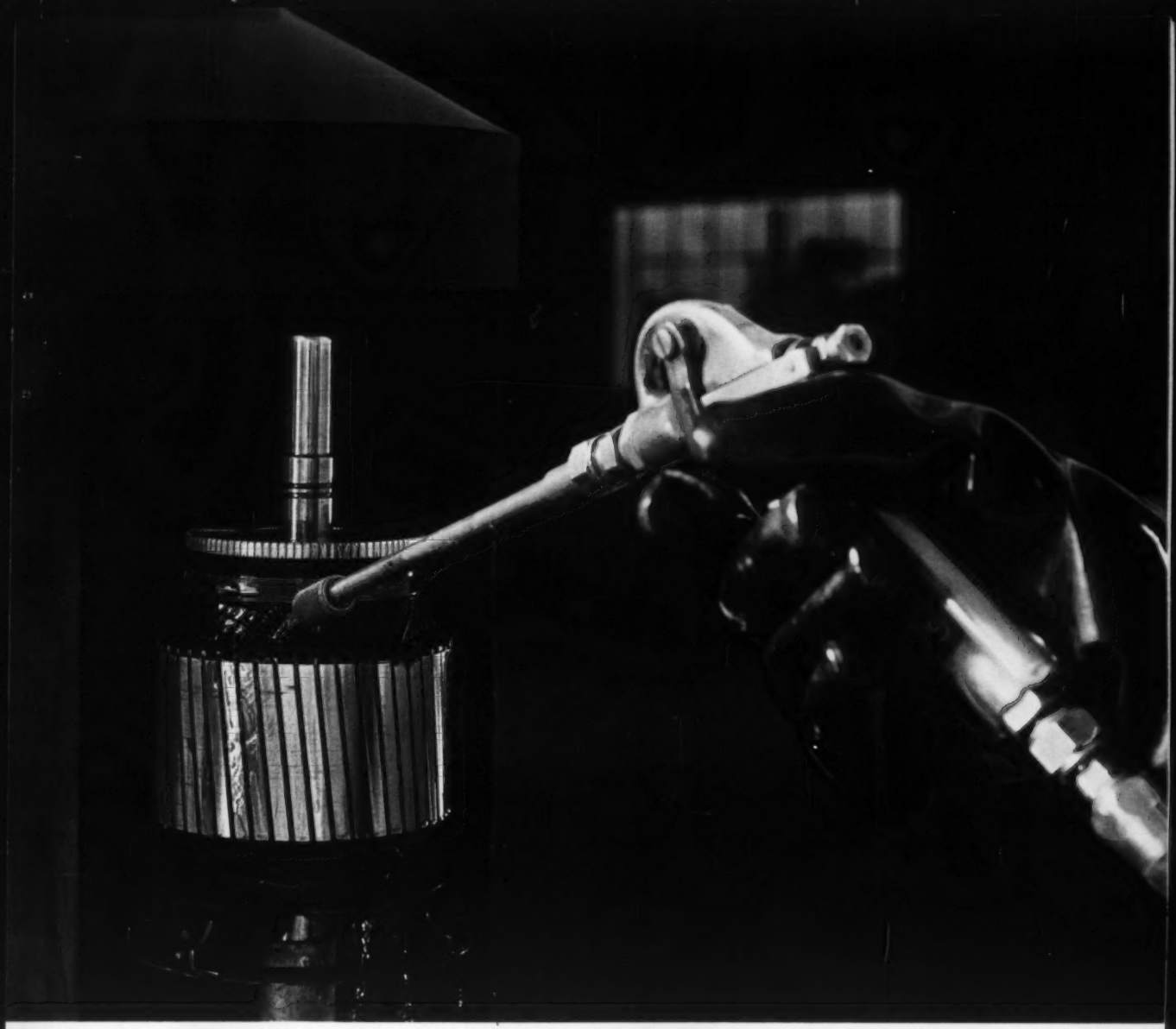
Data Shapes Up—In evaluating results, data was replotted to show currents on a logarithmic scale. Current values at significant slope changes were used to calculate instantaneous corrosion rates. Then, calculated and actual weight losses were compared at the end of the 16-month exposure period. For the steel specimen, actual loss was 19,055 mg. Calculated loss was 18,027 mg. Respective values for aluminum tally 109 mg and 61 mg. These calculated losses are considered quite significant.

Weather data were also correlated with the measurements. During the first two months of exposure, heavy rains fell between dry periods. Calculated corrosion rates for the steel specimen fluctuated considerably. The rates for aluminum were less affected by weather.

Avoid This Pitfall—It must be pointed out that amounts of corrosion and the corrosion rates found in this study in no way indicate the relative merits of the two metals. Only one soil of relatively high resistivity was used as the corrosive medium. Different results might be obtained in other media.

Compare Corrosive Currents





NEW SAFETY SOLVENT HAS LOW TOXICITY

CHLOROTHENE® NU cold-degreasing solvent has all the desirable characteristics of the nonflammable chlorinated solvents *plus* less toxicity. Maximum allowable vapor concentration is a high 500 ppm compared to carbon tetrachloride at 25 ppm. Chlorothene NU shows outstanding superiority in its resistance to fire—it has *no* fire or flash point measurable by standard methods!

This combination of low toxicity and no flash point has led to the wide use of Chlorothene NU in production and maintenance cold-degreasing operations. Chlorothene NU specially inhibited 1,1,1-trichloroethane has an excellent low-corrosion record. It can be used safely on most electric motors, instruments, all common metals—including aluminum, zinc, and corrosion-prone "white-metal" alloys, and many plastics. It is easily recovered by distillation.

Use Chlorothene NU in *your* cold degreasing. Contact your distributor of Dow solvents for complete information about its safety features, uses, recovery and cost. Ask him about Dow trichloroethylene, perchloroethylene and methylene chloride, too. Or get in touch with your nearest Dow sales office.

SEE YOUR DISTRIBUTOR OF DOW SOLVENTS FIRST!

THE DOW CHEMICAL COMPANY DOW Midland, Michigan

Quality plus economy
when you buy
SUMITOMO steel wire rods

Rapid developments in the wire-product field have increased industry's demand for top-quality steel wire rods. Because of its international reputation for reliability, Sumitomo Metal supplies world markets—America in particular—with 7,000 tons of wire rods every month. To keep up with this export demand, Sumitomo Metal has added to its present facilities another new wire rod mill, completely equipped with the most modern machinery available.

Dimensions of Sumitomo Wire Rods	
Diameter	5mm. (13/64")—16mm. (5/8")
Weight	Single Bundle about 270 kgs.—320 kgs. 600 lbs.—700 lbs. Compressed Bundle (6 coils) about 1,620 kgs.—1,920 kgs. 3,600 lbs.—4,200 lbs.

Coil Dimensions on Request

LEADING MANUFACTURER OF STEEL
TUBES AND PIPE, WIRE RODS AND
ROLLING STOCK PARTS

SUMITOMO METAL INDUSTRIES, LTD.

Head Office: Osaka, Japan
Cable Address: "SUMITOMOMETAL OSAKA"
New York Office: 420 Lexington Ave. New York 17, N. Y.
Cable Address: "SUMITMETAL NEWYORK"

NEW PATENTS

Improved Cast Iron

Improvements in or relating to cast iron having a high phosphorus content (assigned to The Staveley Iron & Chemical Co. Ltd., Ralph Victor Riley, Arthur Geoffrey Deeming and George Edwin Else, all of Hollingswood, Derbyshire, England), Aug. 30, 1961. In the treatment of high-phosphorus cast iron, a chill-inducing agent, e.g. magnesium or calcium, is added to the desulfurized melt. Then the melt is cast, and the casting annealed at 800-1000°C. British 876,397.

Steel Alloy

Alloy steel, J. L. Hurley and T. N. Armostrong, Jr. (assigned to The International Nickel Co., Inc.), Nov. 14, 1961. An air-hardenable low-alloy steel having improved yield strength upon tempering consists of 0.35-0.45 pct C, 1.3-1.6 pct Mn, 0.2-0.4 pct Si, 1-1.5 pct Ni, 0.8-1.2 pct Cr, 0.25-0.35 pct Mo, up to 0.1 pct V, and the remainder substantially all Fe. U. S. 3,008,820.

Melting Method

Process of melting ores, metals, glass, minerals and similar fusible materials in a furnace, A. Schmidl and H. Hofer, Nov. 14, 1961. Improved shaft-furnace installation and related process for smelting hematite or other iron-oxide ores. Maximum heat efficiency is obtained by exposing the preheated ore to direct contact with a suitable fuel. U. S. 3,008,819.

Cast-Iron Manufacture

Production of cast iron, H. J. Langangne, Nov. 7, 1961. In a cast iron process, ferrous charges are melted continuously in a ketene-rich reducing atmosphere. This establishes a pseudo-equilibrium between the ketenes and carbon-monoxide constituents. U. S. 3,007,791.

Copies of U. S. Patents are available at 25¢ each from Commissioner of Patents, Washington 25, D. C.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy, just circle the number on the free postcard.

Covers Copper & Brass

A 36-page report gives the full story on copper and brass. Called the "Sheet and Strip Handbook," it covers selection of alloys, mechanical properties, selection of tempers, sheet and strip making, fabrication, corrosion resistance and an appendix with a full list of terms and definitions. (Copper & Brass Research Association)

For free copy circle No. 1 on postcard

Motor Control

"Oil-Immersed Limitamp Motor Control," heads a four-page bulletin which describes a newly designed medium-voltage motor control. Its oil-immersed contactor is used for semi-hazardous and corrosive atmospheres as well as general-purpose applications. Featuring a contactor rated at 50,000 kva, the control unit is rated at 2300 to 4600 v for motors up to 3000 hp. Illustrations show features of front-connected, shielded construction which provide fast installation, safe operation, and low maintenance. (General Electric Co.)

For free copy circle No. 2 on postcard

Hydraulics

The "Vickers Story" is related in a new nine-page suppliers guide. It covers a wide range of questions often asked by vendors, such as: Vendor policies, product mix, plant locations and personnel setup. (Vickers Inc.)

For free copy circle No. 3 on postcard

Graphites Uses

"Design & Application Technics" is a two-color six-page technical magazine, devoted to design, production and application of carbon-graphite parts, powder-metallurgy components, graphite products, and motor and generator brushes and contacts. Each issue contains stories on development in each of these categories. (The United States Graphite Co.)

For free copy circle No. 4 on postcard

Aluminum Data

Latest available information on the properties of aluminum and its many alloys, wrought and cast, is presented in the 1961 edition of "The Aluminum Data Book." It can be had upon letterhead request to the Reynolds Metals Co., Richmond, Va. The 8½ x 11-in., 194-page handbook contains 207 tables of data covering the entire field, offering a valuable guide to the engineer and designer working with aluminum.

Marking Pen

A new universal marking system for round chart recorders with a completely sealed capillary system and replaceable ink cartridge is described in a six-page bulletin. The illustrated bulletin shows how the marking system increases efficiency and reduces maintenance. Also discussed is step-by-step conversion from standard equipment to Mark-Trol, which can be accomplished in less than 10 minutes without removing instrument. (The Esterbrook Pen Co.)

For free copy circle No. 5 on postcard

Temperature Recorder

A portable Speedomax H signalling-recorder for use with "Temtip" expendable immersion thermocouples has been designed to measure and record molten metal bath temperatures. It is fully described in a new two-page data sheet. The recorder provides all the precision features normally included in

Postcard valid 8 weeks only. After that use own letterhead fully describing item wanted. 12/21/61

Circle numbers for Free Technical Literature, Design Digest, or New Equipment:

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FREE LITERATURE

Speedomax H instruments, plus portability. (Leeds & Northrup Co.)
For free copy circle No. 6 on postcard

52100 Alloy

A 42-page technical and metallurgical data booklet titled "52100 Alloy Steel Mechanical Tubing" describes with charts, diagrams and photographs applications, basic characteristics and recommended procedures for 52100 Alloy Steel Tubing. It contains a section on how alloy steel tubing is made; how to properly select tubing and tables of temperature and hardness conversion. (Peterson Steels, Inc.)
For free copy circle No. 7 on postcard

Dust Control

How to solve special dust problems with a high efficiency wet dust collector is explained in a new eight-page booklet. It describes the "Ventrijet," a complete, self-contained unit which utilizes the venturi tube principle. It does not depend on spray nozzles and requires no water pump or outside auxiliary equipment. (Pangborn Corp.)
For free copy circle No. 8 on postcard

Vibrating Screens

Since no one screen will solve every type of problem, one company has developed an extensive line of vibrating screens to meet particular operating conditions, material characteristics and capacities. All the dope on this large selection is presented in a new 48-page book. (Link-Belt Co.)
For free copy circle No. 9 on postcard

Wrought Aluminum

The fourth revision of "Standards for Wrought Aluminum Mill Products" is now being distributed. Replacing the March 1960 version now in use, the new standard contains data on mechanical, physical and other properties, plus standard tolerances for common aluminum alloys. (The Aluminum Assn.)
For free copy circle No. 10 on postcard

Welding Process Chart

This 17 x 22-in. wall chart is designed to aid in the selection of the proper automatic or semi-automatic welding process for a particular application. Submerged arc, inert gas metal arc, carbon dioxide gas, metal arc and tubular wire welding are all covered. Major advantages and limitations of each are listed. (Hobart Brothers Co.)
For free copy circle No. 11 on postcard

Gear Gage

Four-page catalog describes and illustrates a new indicating snap gage with millionths readings. Interchangeability of anvils makes them adaptable for measuring pitch, root and outside diameters as well as recesses, grooves, splines and pin measurement for gears. (Mahr Gage Co.)
For free copy circle No. 12 on postcard

Refractory Data

Insulated fire brick is the subject of a new 16-page brochure. The free literature outlines the advantages, characteristics, and properties of six types of insulating bricks. (Kaiser Refractories Div., Kaiser Aluminum & Chemical Corp.)
For free copy circle No. 13 on postcard

Nickel Numbering

Data sheets present a new numbering system for one company's extensive line of high-nickel alloys. (Techalloy Co., Inc.)
For free copy circle No. 14 on postcard

Vinyl Finishes

A new brochure describes Unichrome B-66 multicolor, spray-on vinyl finishes. The brochure illustrates the deep-patterned multicolor finishes made possible when applied with conventional spray gun application in a one- or two-coat system. (Metal & Thermit Corp.)
For free copy circle No. 15 on postcard

All About Threads

"Thread and Form Rolling" is the title of a 35-page brochure which is crammed with technical information. The material is arranged to present a broader understanding of thread and form rolling for designers, engineers and those actively engaged in the application of the process. (Reed Rolled Thread Die Co.)
For free copy circle No. 16 on postcard

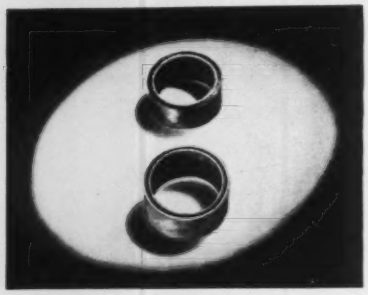
Tape System Units

In eight pages, a condensed catalog describes a line of perforated tape readers, perforators and accessories as well as complete tape systems. Illustrations, block diagrams and clear, concise text all contribute to this easy to-use reference. (Tally Register Corp.)
For free copy circle No. 17 on postcard

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

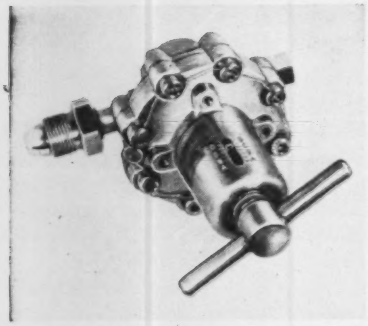
New Materials and Components



Iron-Aluminum Surface Available on Small Tubes

The successful development of new techniques permits "ALONizing" the inside surfaces of mild-steel or alloy tubes as small as ¼-in. ID. Lengths can range up to 21 ft. This process deeply diffuses aluminum into steel to form an iron-aluminum alloy. The result is a surface which offers excellent oxidation and sulfide corrosion resistance at temperatures up to 1800°F. Cost is said to be less than half that of common stainless grades, yet the process provides comparable protection. Tubing can be "ALONized" on the inside, on the outside, or both. (Alon Processing, Inc.)

For more data circle No. 30 on postcard, p. 69



Stainless Regulators Bar Process Contaminants

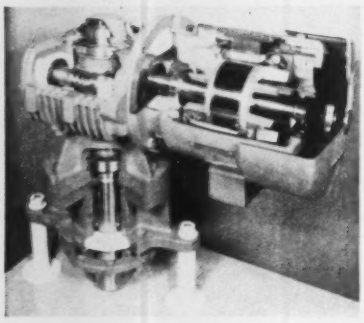
New, all-stainless-steel regulators are ideal for use where outside contaminants affect process or research results, or for the delivery of ultra-pure gases. Each regulator is tested before shipment by internal evacuation to less than 0.3 microns of mercury. The unit is then surrounded with helium and the inboard helium leakage rate is measured. If this rate exceeds 3×10^{-9} atmospheric cc per second, the regulator flunks its test. However, most of the units test out with a leakage rate of about 8×10^{-10} atmospheric cc per second. This is about 1 cu in. in 650 years. Models are available with delivery pressures to 150 psig. (Linde Co.)

For more data circle No. 31 on postcard, p. 69

Precision Switches Feature Molded Switch Plates

With completely-molded and flush switch plates, a new line of precision rotary switches eliminates "stick-slip" worries. The units have good signal-to-noise ratios when switching from light to moderate signals, even under environmental extremes. Each integrally-molded switch plate embodies sections of highly conductive plastic. Each has insert terminals molded to the plastic insulator base. Since conductive and insulating surfaces have similar coefficients of friction and thermal expansion, stick-slip phenomena are nonexistent. In addition, these switchplates present a hard, smooth plastic surface (2-6 microinches) as the path for the precious metal wiper. This cuts down galling and wear. (Markite Corp.)

For more data circle No. 32 on postcard, p. 69



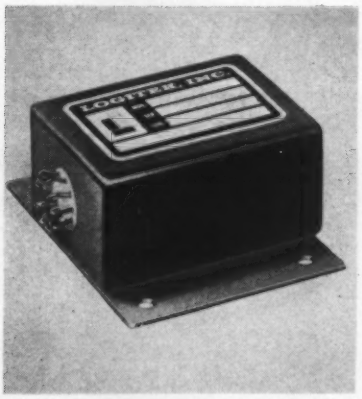
Packaged Drives Provide Low-Cost Agitation

Features of a new agitation drive include a close-coupled motor, an easily-changed helical gear set, rigid agitator-to-drive connection, a single-seal assembly and overall compactness. Quiet operation is another bonus. The new drive supplies power through fixed-gear, fixed-speed belt, variable-speed belt, or variable-speed hydraulic mechanisms. Six standard models, plus custom adaptations, deliver up to 200 hp. An integral cast assembly supports the drive and the seal or stuffing-box housing. Closed top reactors and vessels hook up to standard flanges. For open vessels, bridge mounting solves the hook-up problem. (Pfaudler-Permutit Inc.)

For more data circle No. 33 on postcard, p. 69

Adjustable Time Delays

Availability of a new and complete line of solid-state, time-delay elements has recently been announced. The line includes fixed or variable delays to operate from 50 microseconds to 500 seconds. Standard accuracies are 2, 5 and 10 pct over any combination of 18-31 v dc. Temperature ranges covering —55°C to 125°C are available. On the variable units, timing may be adjusted over a 30 to 1 range. External resistors or potentiometers accomplish the adjustment. Units may be turned on or off before, during or after the timing cycle. Since they can be held off, or externally synchronized, logical operation is possible. The timers are hermetically sealed in 16 different case styles,

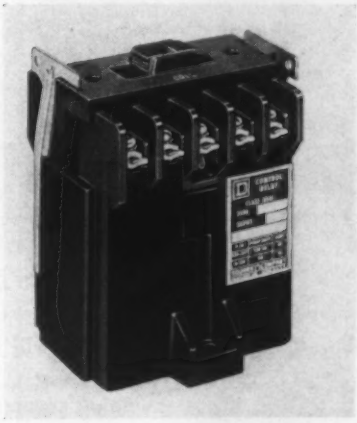


starting at 1 x 1 x 1-in., and a choice of plug-in base, solder hooks or a miniature connector. (Logitek, Inc.)

For more data circle No. 34 on postcard, p. 69

300-v Control System

A new 10-amp, 300-v control system drastically reduces panel space requirements. Available with 2-8 poles, the new basic relays feature modular design and uniform size. This means they occupy the same amount of panel space, regardless of the number of poles. Of course, this greatly simplifies panel layout and subsequent changes. The relays can be butted together in rows to form the sides of wiring troughs. An easy-to-install duct cover fits over the wiring trough, yet leaves all terminals, including the coil terminals, out in the open. According to the manufacturer, this combination of small size plus modular de-

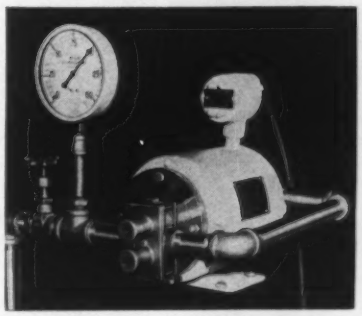


sign can save up to 70 pct of the panel space required by conventional relay systems. (Square D Co.)

For more data circle No. 35 on postcard, p. 69

Canned-Gear Pump

Recommended for use with solvents, corrosive acids and most other chemicals, a new canned-gear pump operates at discharge pressures up to 100 psi. It's particularly recommended for applications where constant system pressure ranges must be maintained. The pump features self-priming action and suction lifts up to 20 ft. According to the manufacturer, it combines all the advantages of canned seal-less pumps and gear pumps. The newcomer eliminates



leakage, seals, packing, lubrication and contamination of the fluid by outside lubricants. (The Corley Co.)

For more data circle No. 36 on postcard, p. 69

Ingenious Extrusion

Consisting of six scroll-type members emerging from a common base, this single extrusion won the Aluminum Assn.'s top award for

THE
FREEDOM
DI
MEN
SION

. . . stretches your design potential

Parts-design becomes as flexible as wax when you specify investment casting. With the "lost wax" process, parts may be designed for function...operating efficiency . . . and wearability. Costly machining and assembly operations are reduced and often eliminated. A wide variety of alloys offers better parts performance and cost reductions.

To discover the benefits Hitchiner Investment Casting can bring you...

write for complete technical and facilities information.

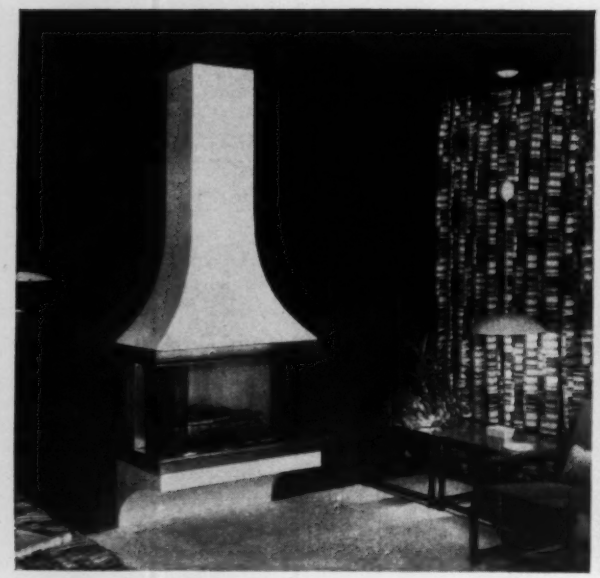
HITCHINER
Milford 4, New Hampshire

Want a sales edge in the market?

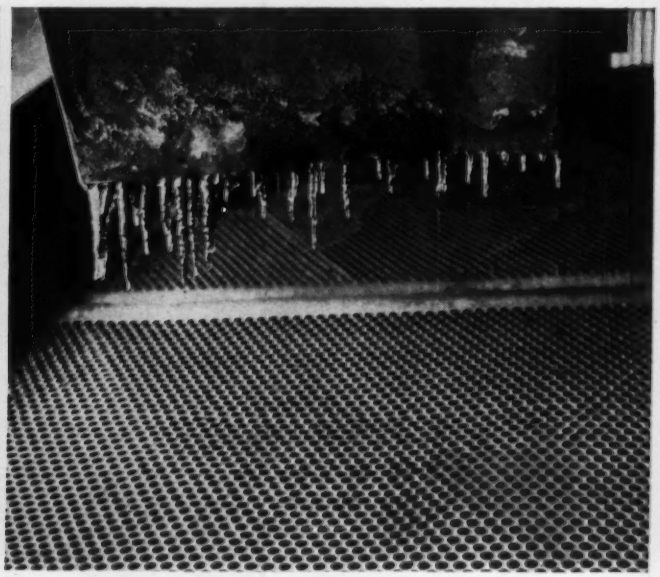
Durability and Stainless Steel enjoy an association that started years ago. In fact, some of the earlier applications of Stainless Steel are still around today, shining examples of real durability. This is a key point: the products are still serving today, and the *primary* point is that the people who purchased them are satisfied.

To provide the market with a product that satisfies is simply good business. It is in this vital product planning area where Stainless Steel can deliver the edge. It will hold up. It provides durability. It is strong, attractive, corrosion resistant.

The decision to swing to Stainless Steel takes measured judgment. It is not an impulse item. It costs more than ordinary materials, but to repeat a cliché, "First cost isn't everything." After all, an



Stainless brightens your home . . . This gleaming Stainless fireplace will last for the lifetime of the home it graces. It will *keep* its gleam, too, because Stainless doesn't corrode and it can be wiped clean with a damp cloth. This maintenance-free fireplace by Vega Industries, Inc., Syracuse, New York, can be installed in less than one day, in any room in the house, whether the home is new or old. Because of its Stainless Steel construction, installation costs are cut as much as fifty per cent.



Stainless Steel works in the coal mine . . . Coal screens, where coal is graded or cleaned, take a daily battering. They are subject to strong acids and water. If they are Stainless, there's no problem. Strong Stainless stands up to rough handling, and its superior corrosion resistance eliminates one of mining's biggest headaches. Stainless Steel screens last many times longer than screens of other materials, making it one of the industry's best investments.

Order Stainless Steel from your nearest Steel Service Center.

Get it with durable USS Stainless Steel

improved product, durability and possibly more market satisfaction deserve consideration. If you feel inclined to learn more about the proper grade of Stainless Steel for your products, write, wire or phone. There is an opportunity in the market today for the durability that Stainless Steel can deliver. United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

Ever hear of a Stainless trailer wearing out? Nobody ever did. Are they durable? Once a Stainless Steel trailer loaded with lamp black caught fire. Cargo and tires burned up. But not the Stainless Steel. They put new running gears on it and it was as good as new. Since Stainless is so strong, this Fruehauf Trailer is lighter and can carry bigger payloads. Since Stainless resists corrosion, painting is unnecessary, and corrosive road salts or harsh industrial atmospheres are never a problem.

. . . and in the ice cream parlor. If you want your restaurant equipment to be attractive as well as long-lasting, make sure it's Stainless. Here is an all-steel unit that includes an ice cabinet, walk-in cooler, beverage dispensers and syrup rail. Its gleaming Stainless front is easy to keep sanitary. Cleaning agents won't harm it and it will *stay* bright and shiny. All the best restaurants (and home kitchens as well) use Stainless Steel for long life, cleaning ease, attractive appearance. This all-steel unit was manufactured by Erickson Industries of River Falls, Wisconsin.

Stainless welcomes your customers . . . This door is Stainless Steel. It creates a first impression that counts—sets off the business man who is proud of his firm. Stainless gives store fronts a quality look. Stainless keeps its good looks, too. The rainfall washes it clean. Stainless Steel's strength, attractive appearance and corrosion resistance make it ideal for outdoor locations. Stainless Steel doors are the *best* doors.

United States Steel USS

TRADEMARK

the most ingenious design. The extrusion provides a basic part that can be easily and economically formed into a number of different designs for use as decorative ros-

ettes and scrolls in metal furniture manufacture. In the initial design stage, the manufacturer requested various rosette patterns to be extruded directly as finished parts. But because of the complicated configurations, these rosettes were impossible to make as a single extrusion. An alternate solution to the problem was the design of the award winning scroll that permitted many different types of patterns to be formed from the one extrusion. (Aluminum Extrusions, Inc.)

For more data circle No. 37 on postcard, p. 69

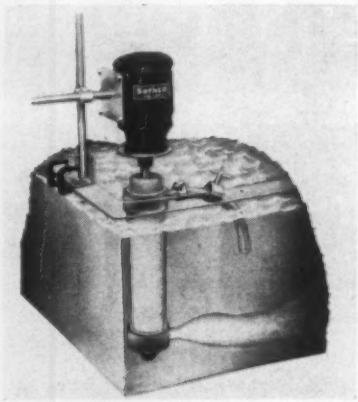
Bonds Plastic Laminates

A new fast-drying, heat-resistant, high-strength contact adhesive bonds decorative plastic laminates to plywood and particle board. Designated as "Fastbond" 10, this synthetic rubber based adhesive permits bonding of the laminate within 10 minutes after adhesive application under normal conditions of temperature and humidity. The adhesive, however, will still provide an excellent high strength bond after one hour or more open time. (Minnesota Mining and Mfg. Co.)

For more data circle No. 38 on postcard, p. 69

Submerged Filters

Constant jet agitation, simplified assembly and easy disassembly, improved pump design and brushless motor—all are now standard features in an advanced submerged-filter system. Constant jet agitation means the agitator operates independently, or together with filtration. It can be positioned to agitate solution in any desired direction within the tank. This eliminates the need



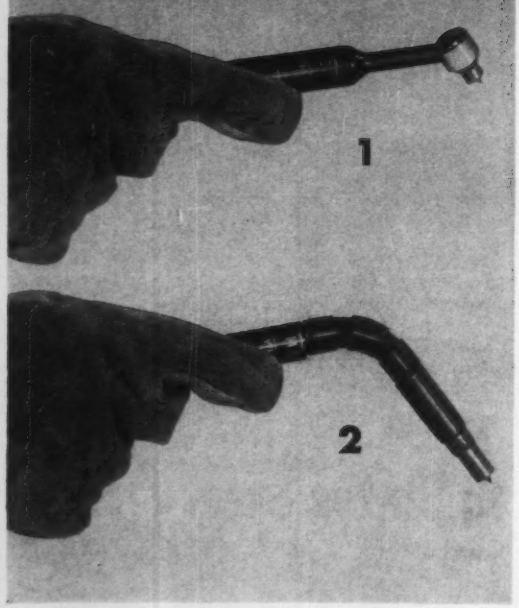
for a rocking cathode bar or a stirrer. Rate of agitation can be adjusted by increasing or decreasing the size of the jet port. Long motor life is guaranteed since motors are now split phase and fan cooled. (Sethco Mfg. Corp.)

For more data circle No. 39 on postcard, p. 69

LINDE ELECTRIC WELDING

HELIARC

PERFECT PAIR FOR "TIGHT-SPOT" JOBS



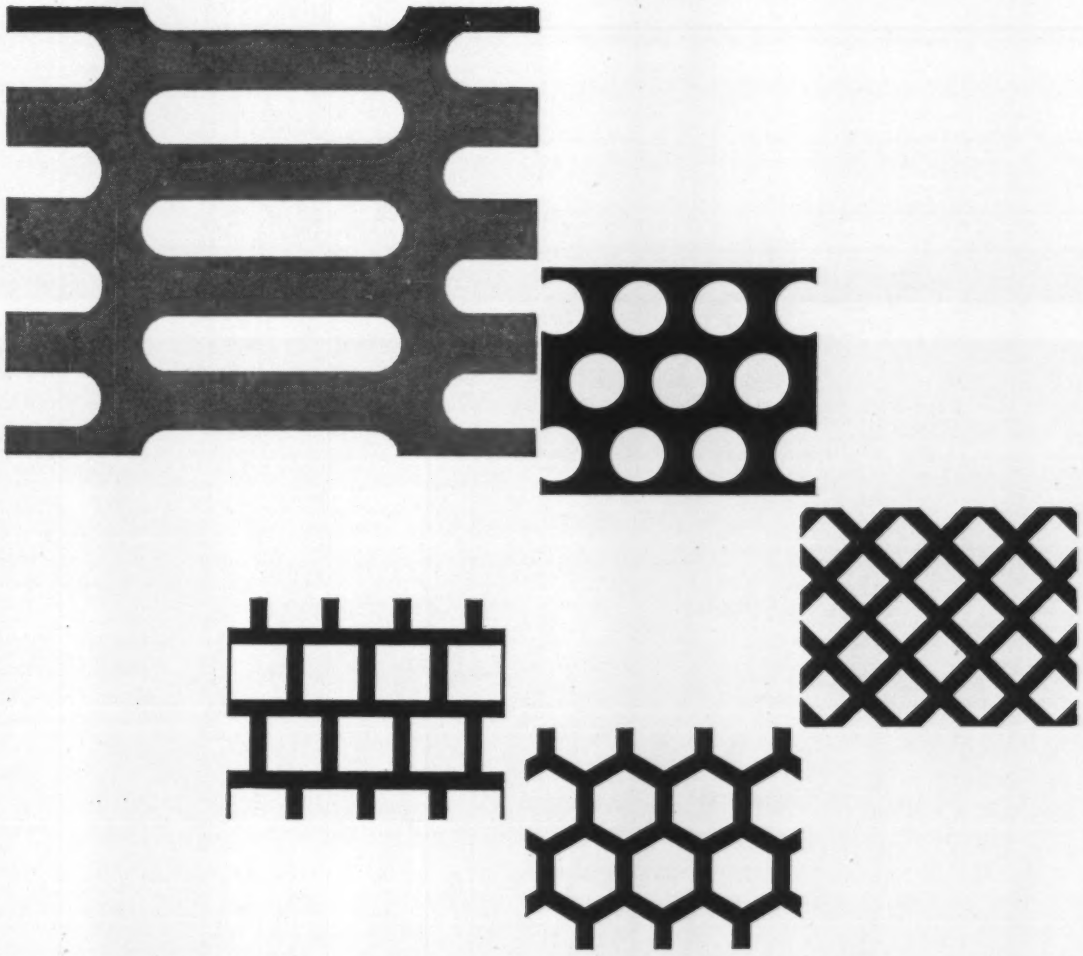
1. Smallest—meet the HW-24, tiniest HELIARC torch ever (5⅛-in. x 1-in. head) for welding inside narrow, inaccessible diameters as low as 1¼ in. Specially designed for aircraft applications. A 2½-oz. featherweight. 75-amp capacity, 100% duty cycle. Air cooled. Price: $47.50.

2. Most Flexible—here's the HW-25, the "Adjustable Angle" HELIARC torch. Just flex the neck and you can weld inside corners, "backhand" under ledges, in confined spaces between channels and shapes. Flexes to fit any job—stays put until reset. Long flexing life, too—the neck uses *spiral copper strands* for strength and durability, *not* metal tubing that bends and breaks. 200-amp capacity, 100% duty cycle. Water cooled. Price: $87.50.

Nobody tops LINDE's line of HELIARC welding equipment for quality, flexibility and completeness. For full details on the HW-24 and HW-25—as well as the high-powered HW-20 and long-distance shielding with the HELIARC Gas Lens—contact your local LINDE office or write direct.

LINDE COMPANY
Division of Union Carbide Corporation
270 Park Avenue, New York 17, New York

UNION CARBIDE



put an extra plus in new products... HENDRICK perforated metal

Metalworking fabricators well know the importance of adding to product appearance **while the product is in the design stage.** That's why so many design engineers come to Hendrick for advice. Hendrick's vast stock of dies and perforating experience are invaluable aids to manufacturers planning new design application and product development.

Hendrick perforated metals are available in a wide variety of patterns in every commercially rolled metal. Hendrick also perforates masonite, rubber, plastic and insulated board. Each can be supplied in a large number of sizes in plain or panel effects. Hendrick perforated metal is available in round, hexagon, square, slot and diamond openings. Mail the coupon for more information.

HENDRICK Manufacturing Co.
Carbondale, Penna.

Perforated Metal Screens • Wedge Wire Screens • Cascade Wedge Wire Screens • Wedge Slot Screens • Rubber Clad Perforated Screens • Flanged Lip Screens • Flights • Shaker and Conveyor Troughs

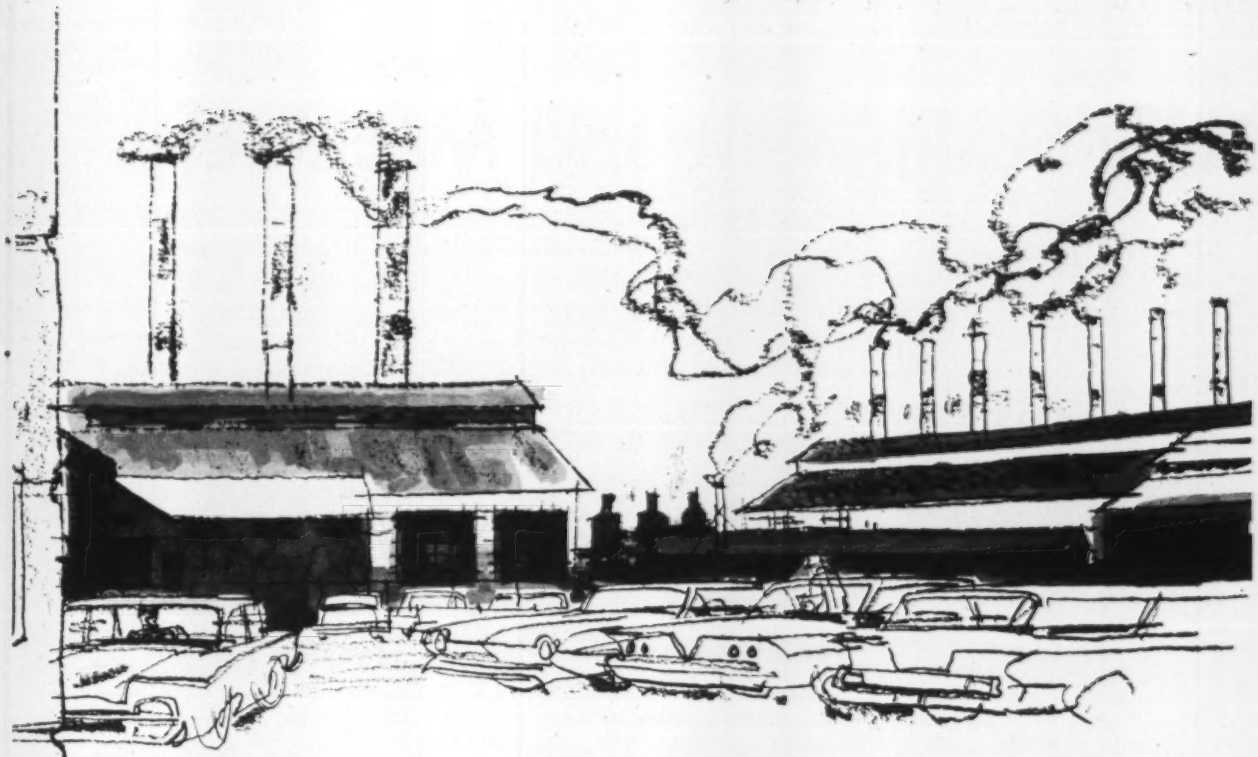
HENDRICK Manufacturing Company
Carbondale, Penna.

Gentlemen:

☐ Please have representative call.
☐ Send me FREE literature on Perforated Metal.

Name _____
Title _____
Company _____
Street _____
City _____ State _____

STEEL
C. Schulz



"We've got to pick up the quality of our free-machining steels—and fast. Foote tells me their Nitrelmang produces a high recovery of nitrogen."

"I hear the same. And no carbon or silicon pick-up. If true, I buy. But, first, let's make them prove it."

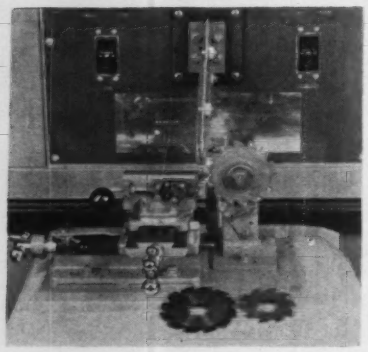
We will prove it. And part of the proof is right here. When you add Nitrelmang® to a heat, pure manganese and pure nitrogen are *all* you are adding. No carbon. No silicon. No headaches. Typically, Nitrelmang contains 94.65% manganese, 4.75% nitrogen, 0.50% oxygen and only 0.04% carbon. Because it is introduced in pure form, nitrogen recovery is high (75% to 85%) and uniform, more efficient than that from chemical compounds. Most important, the final "product" —the machinability of your steel—is greatly improved.

Nitrogen in steel provides greater strength at higher temperatures. And in high-chrome, fine-grained steels, nitrogen stabilizes austenite, inhibits grain growth. In all these, and in other applications, precise control over the quantity of nitrogen added is critical. Foote Nitrelmang gives you the required control. This property of Nitrelmang, together with the ability to limit impurities in the ingot, means a head start in producing quality steels and happier customers. In addition, furnace time and processing time are reduced.

There's more to be said about opportunities available to you in the use of Nitrelmang. Write for Bulletin 206, Foote Mineral Company, 438—18 West Chelten Ave., Philadelphia 44, Penna.

FOOTE
MINERAL COMPANY

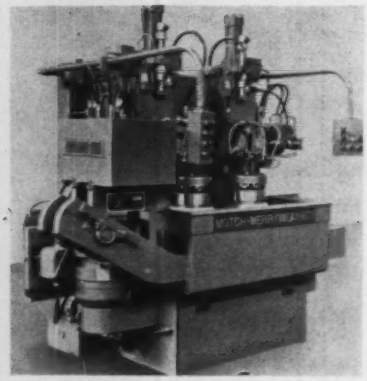
New Equipment and Machinery



Brazing Fixture Eases Carbide-Cutter Tipping

Depending on the thickness of the cutter, a new brazing fixture will braze one carbide tip in 5-8 seconds. It will handle diameters ranging from 4-12 in., with either 10, 12 or 14 teeth per cutter. Thicknesses can vary from ⅛-⅜ in. This same fixturing can also be used to remove broken carbide tips in a matter of seconds. In operation, the fixture properly positions tooth and tip with respect to the work coil. Micrometer adjustments make it possible to hold tooth and tip, both linearly and axially, to within a 0.002-in. tolerance. These adjustments are only necessary at the beginning of a run of new cutters. A detent applies downward pressure on the carbide while it's being brazed. (Induction Heating Corp.)

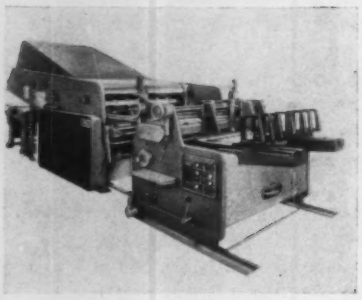
For more data circle No. 40 on postcard, p. 69



Versatile Conveyor Fits Any Machine Tool

Here's a vertical turner with a built-in chip-removal conveyor as optional equipment. This conveyor is unusual in that it can be built from off-the-shelf components to fit any machine tool, regardless of space or load requirements. It installs on the machine, above floor level, flush, or below floor level. And its speed may be synchronized to the metal removing capacity of the machine. Conveyor link belts are also available with drain holes to reclaim oil and coolant. In addition, the conveyors can handle hot, wet or dry chips, borings and turnings from constantly running machine tools. Chips can be routed in any direction to channel the scrap clear of the machine into scrap bins or to a carry-off conveyor system. (May-Fran Mfg. Co., a division of Fischer & Associates, Inc.)

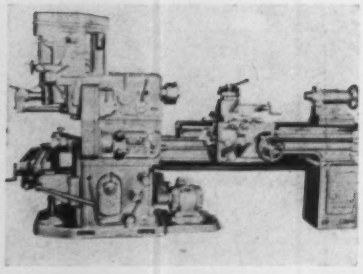
For more data circle No. 41 on postcard, p. 69



Automatic Press Features Two-Stage Stripping

According to the manufacturer, this new model is the most complete automatic die-cutting and creasing press on the market. With the introduction of a field-tested two-stage stripping unit, the new press can print, die cut, strip all internal, side, back and leading-edge trim, and discharge corrugated or solid fiberboard sheets in counted and squared stacks. Speeds range up to 60 sheets per minute. Two major sections comprise the equipment—an automatic feeding unit, and a die-cutting and creasing assembly. (S & S Corrugated Paper Machine Co., Inc.)

For more data circle No. 42 on postcard, p. 69



Universal Machine Tool Handles All Repair Work

This universal machine tool combines lathe, shaper, horizontal and vertical miller, and drill press into one compact unit. It's ideal for maintenance and repair work where its unusual design offers many advantages. For instance, its five-in-one versatility means it can handle just about any machining task. Two operators can use it at the same time to speed priority work. Of course, combining five machine tools into one also results in cost savings. Initial cost is about 50 pct less. (Bromfield Corp.)

For more data circle No. 43 on postcard, p. 69

This mark tells you a product is made of modern, dependable Steel.

"T-1" Steel cuts spiral case weight 45% at Oahe Dam

Oahe Dam will be the world's largest rolled earth dam . . . 9,300 feet long and 242 feet high. It will create a lake 250 miles long on the Missouri River above Pierre, South Dakota. Seven hydro-generators will have a total installed power capacity of 595,000 KVA.

USS "T-1" Steel cuts weight of spiral cases. Water for power generation will flow through seven spiral cases with inlet diameters of 20½ feet. USS "T-1" Constructional Alloy Steel not only met all requirements, but permitted a reduction of about 45% in the weight of the steel used. The total amount of USS "T-1" Steel used was 1,002 tons.

Cost Savings. By using USS "T-1" Steel, with a minimum yield strength of 100,000 psi, plate thicknesses ranged from ½" to 1¼". With carbon steel, they would have been almost twice as thick. Result: large savings in freight costs, erection time, and field welding costs. In future projects, costs might be reduced even more by the use of our new, more economical USS "T-1" type A Steel which has the same strength.

Giant steel tunnel liners, 24 feet in diameter and averaging 2,200 feet long, will carry water for power generation. 20,000 tons of structural carbon steel were used by U. S. Steel's Consolidated Western Steel Division to fabricate 449, 30-foot-long sections for the seven tunnel liners.

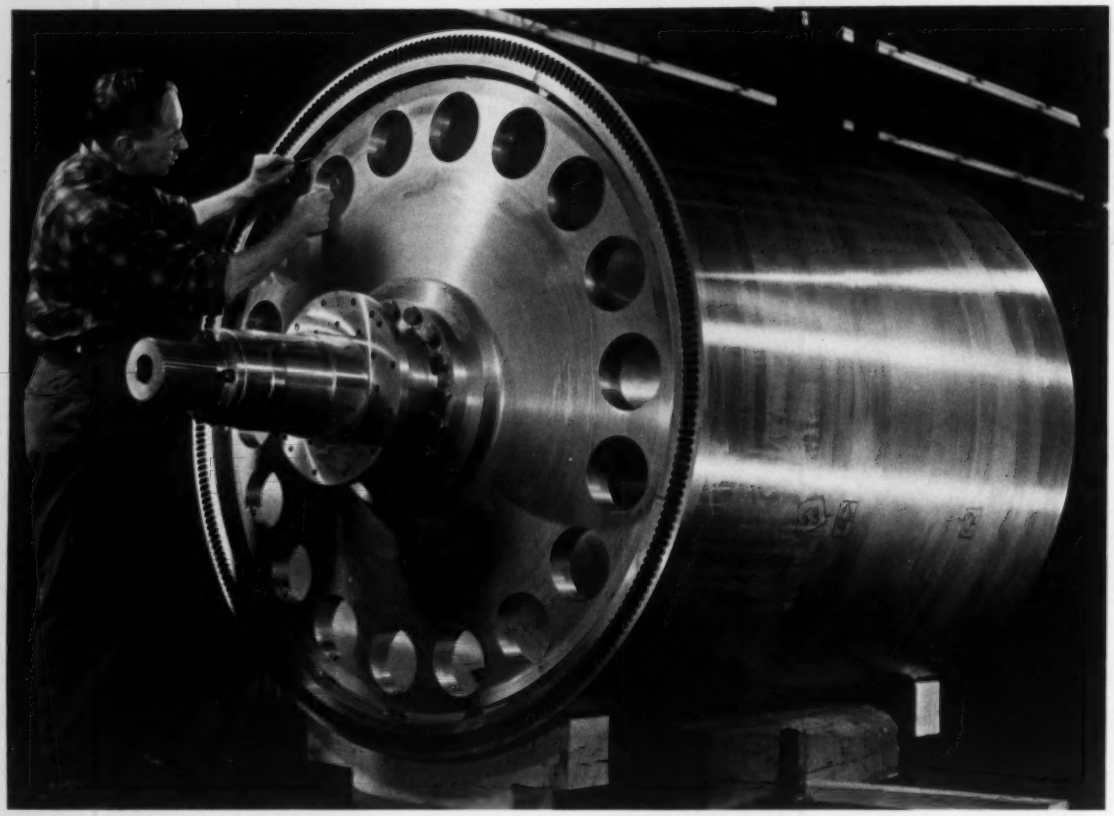
The Oahe Dam is being constructed under the supervision of the Corps of Engineers—U. S. Army, Office of District Engineer, Omaha, Nebraska. Powerhouse A-E: Sverdrup and Parcel. Powerhouse contractor: Atkinson-Ostrander Company. Spiral cases were fabricated by the Hydraulic Division of the Allis-Chalmers Manufacturing Company (the supplier of completed turbines), and field-welded and assembled by Chicago Bridge & Iron Company. Generators were supplied by General Electric Company.

For more information write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS and "T-1" are registered trademarks.

United States Steel Corporation • Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

United States Steel

Rough-machined ring and forged ring being sawed at our Homestead Works.
Three-ring rotor, showing rectangular holes through ring wall, with end plates and tubular spindle assembled into a unit ready to ship.



How to bring a missile back through temperatures to 8,500°F

You can broil a steak at 350°F. Pure iron melts at 2795°F. Most meteorites burn up when they enter the earth's dense atmosphere. Today, man is firing missiles to meteoric altitudes—but the problems of tolerating the extreme temperatures of re-entry have been the greatest challenge to his ingenuity.

One of the major obstacles to simulating re-entry conditions was how to produce for realistic time durations pure air in large volumes at meaningful temperatures, pressures and velocities. This problem is being solved with the *Wave Superheater*—an innovation in hypersonic wind tunnels. Temperatures to 8500°F, pressures to 200 atmospheres and velocities up to Mach 15 can be attained with this facility. Cornell Aeronautical Laboratory has devised this equipment to test full-scale missile components in the laboratory.

The wave superheater is essentially a blow down system using a rotor with 288 tubes (passages) drilled into its periphery. The shock tubes are charged with air; then a driver gas (helium) at a pressure of 1500 psi is released through one end of each tube, successively superheating by shock waves the air which is then collected and expanded into the wind tunnel. The rotor operates at a maximum temperature of 800°F; each tube is momentarily cooled as it rotates, to be ready for the next charge.

Rotor Ring Forgings. The heart of the superheater is the rotor made from three USS Stainless W forgings. The rough-machined rings are each 63″ OD, 54″ ID, 23½″ long and weigh 6,000 pounds each. USS Stainless W was chosen for this demanding application because of its precipitation hardening characteristics, and its ability to retain the required high strength at the operating temperature.

The three rings were obtained from a 59″ diameter ingot, which was cogged, sheared, upset-forged, punched and finally mandrel-forged under our 10,000-ton press. After rough machining and completing the inspections called for, the rings were shipped to 20th Century Machine Tool Company, Utica, Michigan, who drilled and broached the holes seen in the assembled view of the three-ring rotor. With an assist by Hoover Tool & Die Company, Warren, Michigan, the final machining and assembly was completed in 10 months.

No matter what kind or size of USS Quality Forgings you need, you get the advantages of the finest steel, the most modern equipment and the most skilled forging men in the world. Address inquiries to United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. A copy of our booklet "USS Nuclear Forgings" may be secured by writing to the same address. USS is a registered trademark.

United States Steel Corporation · Columbia-Geneva Steel Division · Tennessee Coal and Iron Division · United States Steel Export Company

USS TRADEMARK **United States Steel**

5555-2

Huge Cleveland bridge combines USS High Strength and Carbon Steels to save weight and reduce costs

The new $18 million, 8-lane Cleveland Inner Belt Freeway Bridge is 116 feet wide and 4,223 feet long. It can handle 95,000 vehicles a day. The $8,130,000 contract for superstructure erection was the largest single contract every awarded by the Ohio Department of Highways.

The bridge spans the Cuyahoga River, a dock area, two major highways, a railroad freight station, numerous tracks and industrial buildings. This made adequate clearance a major problem which USS High Strength Steels helped to solve.

Where the designers specified high-strength low-alloy steel in the highly stressed members, the fabricators used USS MAN-TEN (A440) and USS COR-TEN High Strength Steels. These steels each have a minimum yield point of 46,000 psi (or, recently, 50,000, to 1½" for USS COR-TEN Steel) and permit a design stress of 24,000 compared to 18,000 psi for A7 steel. Weight was reduced by as much as 25% in many truss members. This made USS MAN-TEN (A440) a cheaper steel to use than A7 carbon steel in cases where weight reduction amounted to 17% or more. Where A7 carbon steel would do the job less expensively, it was used.

Nearly 21,000 tons of steel went into the completed bridge and approaches. Of this, 8,012 tons were USS High Strength Steels, 12,261 tons were A7 steel and the rest was miscellaneous castings and forgings.

The new concept of combining steels of various strength levels for bridges, buildings and heavy industrial equipment is gaining wide acceptance. You can save substantial amounts of money, cut dead weight and obtain more durable structures by using the *right steel for the job!*

For more information on the USS "Family of Steels" for design, write to United States Steel, Room 6433, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS, COR-TEN and MAN-TEN are registered trademarks.

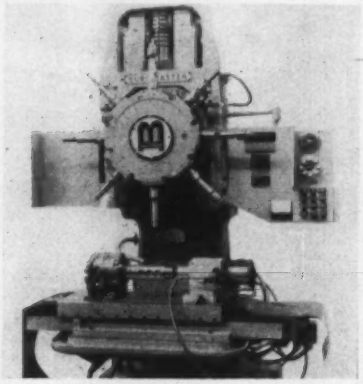
United States Steel Corporation • Columbia-Geneva Steel Division • National Tube Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

United States Steel USS

Cleveland Inner Belt Freeway Bridge is part of the Interstate Highway System. **Consulting Engineer:** Howard, Needles, Tammen & Bergendoff, St. Louis. **General Contractor for Main Bridge:** John F. Beasley Construction Company, Chicago. **General Contractor for East Approaches:** Horvitz Company, Cleveland. **General Contractor for West Approaches:** National Engineering and Contracting Company, Cleveland. **Structural Steel Fabricator for Entire Bridge:** Fort Pitt Bridge Works, Pittsburgh.

Positions the Work

Here's a new multi-position table that's controlled by a six-position indexing stop roll similar to the index of a turret lathe. The newly-

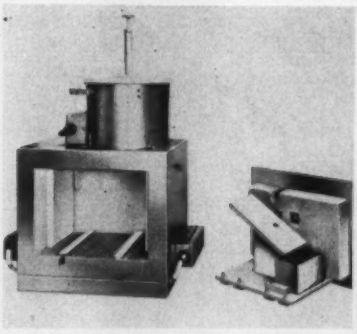


developed, hydraulically - actuated unit accurately controls a preset sequence of operations. It can be positioned and indexed for a wide variety of machining operations. However, it's especially suited for workpieces requiring machining in more than one plane. Standard table size is 14 x 36 in. with an 18-in. stroke. Larger sizes are available upon request. (Burgmaster Corp.)

For more data circle No. 44 on postcard, p. 69

Drip-Test Furnace

With this new laboratory furnace, research personnel can test the corrosive effects of liquids at varying



temperatures. Temperature range is ambient to 1202°F. Checks are made by determining the degree corrosion caused by the liquid in question. Test sample, liquid, or both can be heated to the desired temperature. The furnace should

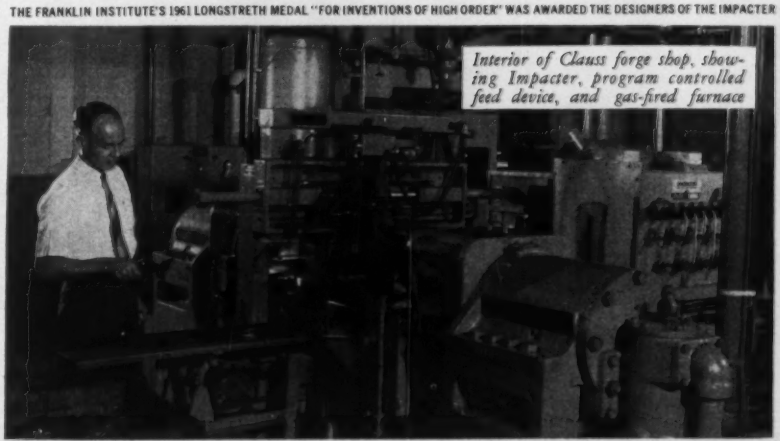
Detail showing tong positioning hot stock between Impacter dies

BETTER
drop forgings
FASTER
automatically...on the Impacter

Clauss Cutlery Company, Fremont, Ohio, is getting **better quality, increased production, reduced scrap,** and **savings in stock** required per forging, for their famous Clauss line of scissors, shears and snips. The Cecomatic Forging Process, incorporating the new **Model "C" Impacter,** is responsible for these and many other outstanding benefits. To learn how, write for a reprint of The Clauss Story and a copy of Bulletin 110-L-1.

CHAMBERSBURG ENGINEERING COMPANY • CHAMBERSBURG, PA.

THE FRANKLIN INSTITUTE'S 1961 LONGSTRETH MEDAL "FOR INVENTIONS OF HIGH ORDER" WAS AWARDED THE DESIGNERS OF THE IMPACTER



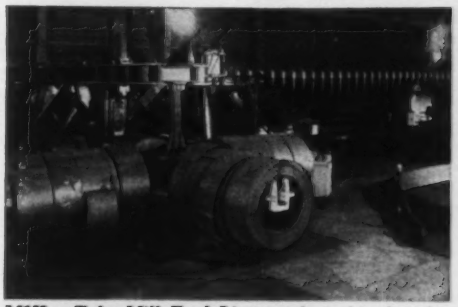
Interior of Clauss forge shop, showing Impacter, program controlled feed device, and gas-fired furnace

CHAMBERSBURG

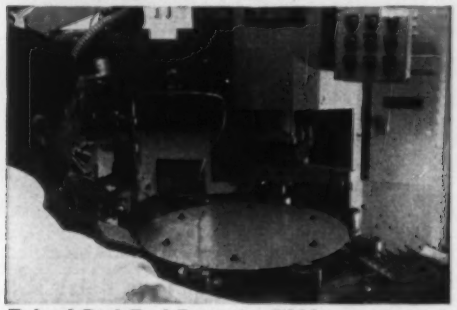
Warco
PRESS

◀ ***Warco Press Line*** composed of three 400-ton straight side, eccentric gear presses forms automobile wheel "spiders" at The Budd Company's Detroit plant. Here, William F. Longfield, manager of press engineering and sales for McKay's Federal-Warco Division, looks over a finished wheel with Edwin Seiberlich, works manager, and R. O. Greenshields, plant manager.

Photo by ARNOLD NEWMAN



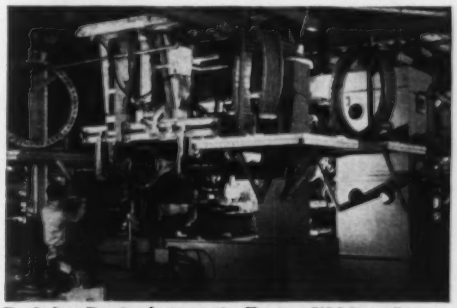
McKay Tube Mill Feed Line sends steel to the tube mill continuously at a rate of 1,800 fpm at U. S. Steel's National Tube plant at Lorain, Ohio.



Federal Dial Feed Projection Welder, one of several used by the Bendix Corporation to weld transistor assemblies. It will weld 2,000 assemblies per hour with exacting precision.

Uncoiling, flexing, processing, slitting, shearing, feeding, forming, stamping, and welding . . . keeping ***metal in motion*** in the most economical manner possible, from coil to finished product, ***is the business of McKay Machine.***

McKay Machine, its divisions and subsidiaries produce the widest range of metal preparation, processing, forming and welding equipment available anywhere. Because of this they can design and build complete, integrated production lines of perfectly mated machinery. This makes it possible to achieve compactness and bring about efficiencies not otherwise practical. It also means the manufacturer is concerned with only a single source of responsibility and supply. That's why more and more cost-conscious metalworking firms are making it a point to know *The McKay Machine Company, Youngstown 1, Ohio.*



Berkeley-Davis Automatic Fusion Welding Lines, such as this one of two recently installed at American Metal Products Company in Detroit for the automatic production of over 200 sizes of motor vehicle axle housings, lead the industry in precision operation, production efficiency, and flexibility.

SUNBEAM electric heater cases get uniform finish with RANSBURG electrostatic. . . . 6 times as many per gallon of paint—15 times faster.

"Paint Mileage Leaps 500%.... Production Upped 15 Times" Reports ENAMELED STEEL & SIGN CO.

Curt Simmons, President, ENAMELED STEEL & SIGN COMPANY of Chicago, describes results with RANSBURG Automatic No. 2 Process Electro-Spray: "We first painted cases for the new SUNBEAM portable electric heaters with air hand spray at the rate of 200 pieces per day using 6 gallons of paint. Now, with RANSBURG electrostatic we've increased production 1400% to 3000 pieces daily with only 15 gallons of paint." An increase of 500% in paint mileage! *What would savings like this mean in your finishing department?*

QUALITY IMPROVED WITH RANSBURG ELECTRO-SPRAY

Sags and runs, a problem with the air hand spray, have been eliminated with the automatic electrostatic equipment. Mr. Simmons adds: "Now we achieve a uniformity over the configurated area which wasn't always possible before. We know the 50,000th piece will turn out the same as the first."

ENAMELED STEEL—sold on the efficiency and versatility of RANSBURG Electro-Spray—uses 14 automatic No. 2 Process units to meet the heavy demands of their diversified, high volume production.

NO REASON WHY YOU CAN'T DO IT TOO

Manufacturers—large and small—are reporting similar savings in paint and labor with increased production. If your volume doesn't justify automatic electrostatic equipment, perhaps the RANSBURG electrostatic hand gun will help cut costs in your finishing operation. Write for our new brochure showing actual in-plant production photos, savings figures and detailed information on RANSBURG No. 2 Process Electro-Spray.

RANSBURG

RANSBURG Electro-Coating Corp.

Box 23122, Indianapolis 23, Indiana

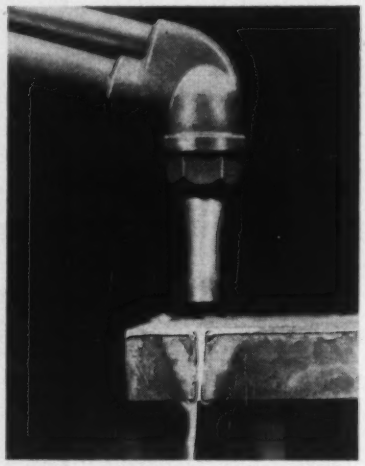
Affiliates in AUSTRALIA • AUSTRIA • BELGIUM • BRAZIL • DENMARK • ENGLAND • FRANCE • FINLAND GERMANY • HOLLAND • INDIA • IRELAND • ITALY • NEW ZEALAND • NORWAY • PAKISTAN • SOUTH AFRICA SPAIN • SWEDEN and SWITZERLAND

have widespread uses in industries that produce or use glass, ceramics, base metals, alloys and many other materials. It can also be used to test corrosive effects on glazes, coatings and platings. Some other possible applications include viscosity studies, experiments on the stability of compounds, and tests on the adhesive properties of coating materials under high temperatures. (Hevi-Duty Electric Co.)

For more data circle No. 45 on postcard, p. 69

Efficient Nozzles

This new series of cutting nozzles provides high flame-cutting efficiency with natural gas and propane. The newcomers are ideal for scrap



cutting, beveling, piercing, or cutting of rust- and scale-encrusted slabs up to 30-in. thick. These nozzles provide extremely high preheat, far above normal requirements. Higher preheat means faster starts than other nozzles using normal preheat gas flows. This feature is particularly important for natural gas and propane which have a lower maximum-flame temperature than acetylene. (Linde Co., a division of Union Carbide Corp.)

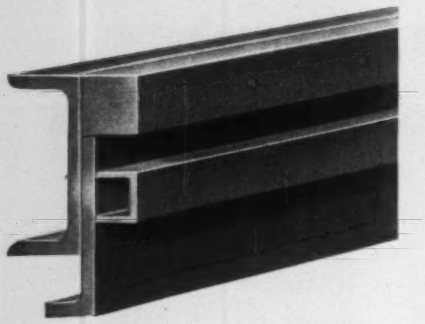
For more data circle No. 46 on postcard, p. 69

Gages Skewness

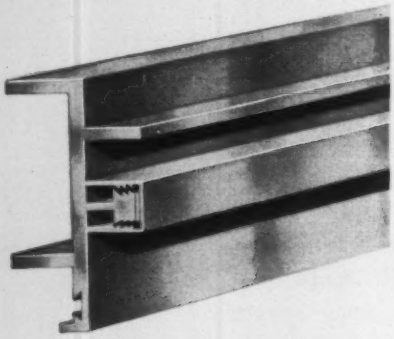
For precision measurement of insulation segments used in the Minuteman rocket engine, this special gage checks any skew which may occur in cutting the segments after

HITACHI
a name to remember
in special iron & steel products
The demands of modern living are nowhere more dramatically reflected than in the increasing demand for iron and steel products, and we are proud to be helping to meet that need. Our products include malleable pipe fittings and iron castings; ductile cast iron for use in crankshafts, camshafts, sprocket wheels, etc.; cast iron and steel parts for rolling stock, automobiles and rolling mills; forged steel parts for industrial machinery (rotor shafts, thrust shafts, counter shafts, axles, gears, rollers, etc.); machine tool steels, high speed steels, stainless and other special steels. We are the largest manufacturers in Japan and have exported the above products all over the world.
Hitachi, Ltd.
Tokyo Japan
Cable Address: "HITACHY" TOKYO

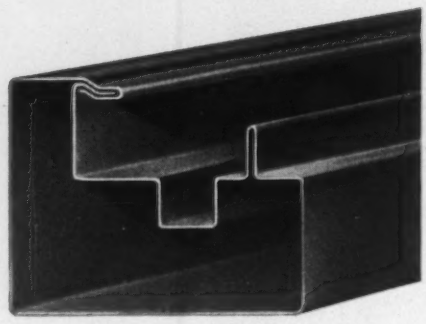
Have your components



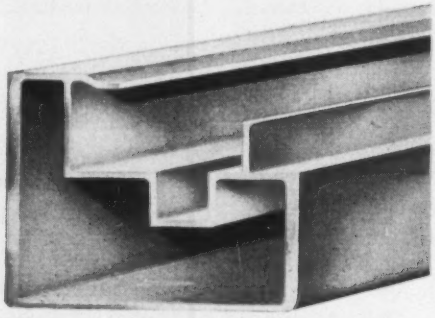
BEFORE: four standard shapes assembled to form a complex unit.



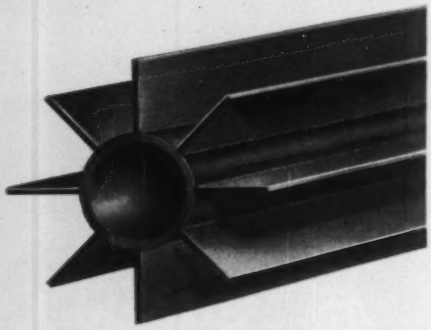
AFTER: two extruded shapes snap into place, saving time, eliminating fasteners.



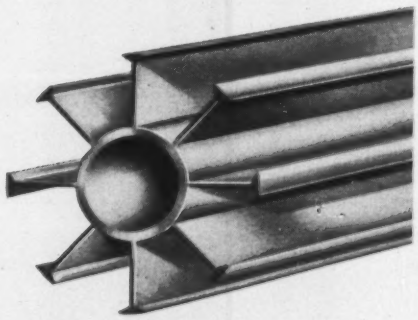
BEFORE: a roll-formed steel sheet.



AFTER: a stiffer, stronger aluminum extrusion with closer dimensional accuracy . . . design flexibility . . . and lower costs.

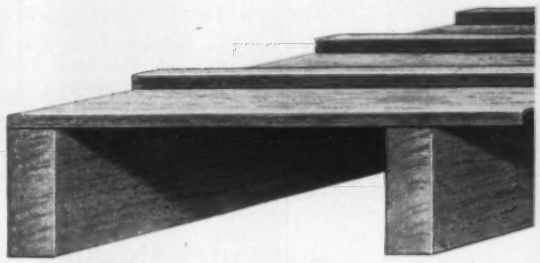


BEFORE: a labor-consuming soldered copper assembly.

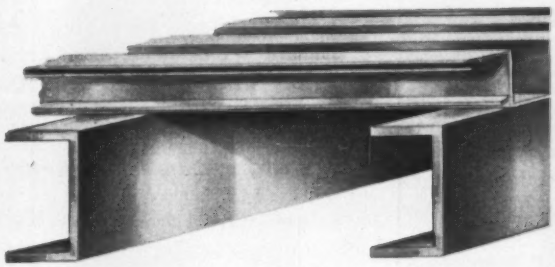


AFTER: a finished aluminum extrusion that is far less costly, lighter, stronger, and produced to closer tolerances.

had their yearly checkup?



BEFORE: friction rails . . . deck . . . cross-beams . . . all of wood.



AFTER: extrusions of light, low-cost, rot-proof, splinterproof aluminum do the job. Hollow rails make cooling or heating easy.

More and more companies have consulted extrusion specialists . . . and switched from rolled, crimped, welded, machined or assembled parts to cost-cutting aluminum extrusions.

Have an independent extruder analyze your product line right away—and regularly from now on. The chances are excellent that he can help make major cost savings.

Production techniques and aluminum alloys have improved rapidly over the last few years. That is why it takes a specialist—an experienced extruder—to keep up with all of the many cost-saving possibilities that aluminum extrusions now offer.

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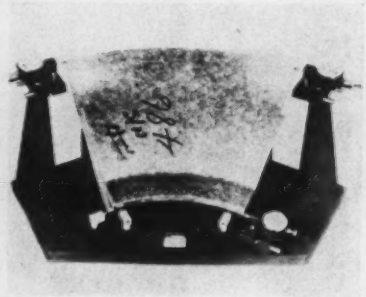
NEW EQUIPMENT

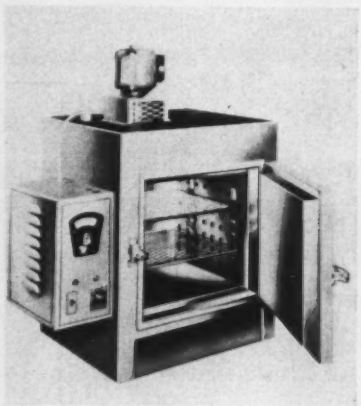
molding. When fitted, these premolded, phenolic segments form a shield that protects the engine from high-velocity exhaust gases burning at 4000°F. Thickness of the segments tapers from ½-⅛ in. In the gaging operation, chordal readings are taken end-to-end and corner-to-corner. It's also possible to take direct measurements from any given location. The gage itself, which measures 18 in. across the top, has seven fixed reference points and three 0.0001-in. indicating dials. Retraction springs permit rapid positioning of the part. Since most of the components are standard shelf items, development of this rather complex unit took just two to three weeks time. (Boice Gages, Inc.)



For more data circle No. 47 on postcard, p. 69

Electric Utility Ovens

Good for general laboratory and production work involving baking, drying, conditioning, preheating and similar utility procedures, a new horizontal airflow oven is already in extensive use for processing small batches of components. Its sensitive controlling thermostat provides stable working temperatures and a quick visual indication of oven temperature. A power selector switch automatically controls wattage input in relation to operating temperature. Recirculating horizontal airflow is effected by means of a turbo blower linked to a heavy-duty motor. Enclosed in the top oven section, a cylindrical heating element provides shielded operation with no radiant heat. (Blue M Electric Co.)



For more data circle No. 48 on postcard, p. 69

Discharge Machine

Featuring a new large-capacity tank that opens in front for easy access, a new electrical-discharge machine handles workpieces as large as 19 x 14 x 10 in. Throat clearance is now 16¾ in. In addition, the newcomer offers complete maneuverability. Other highlights include: Magnetic electrode holder for working and locating to 0.0002 in.; specially-designed hydraulic servo; and a table with jig-borer accuracy. (Charmilles Engineering Works, Ltd.)

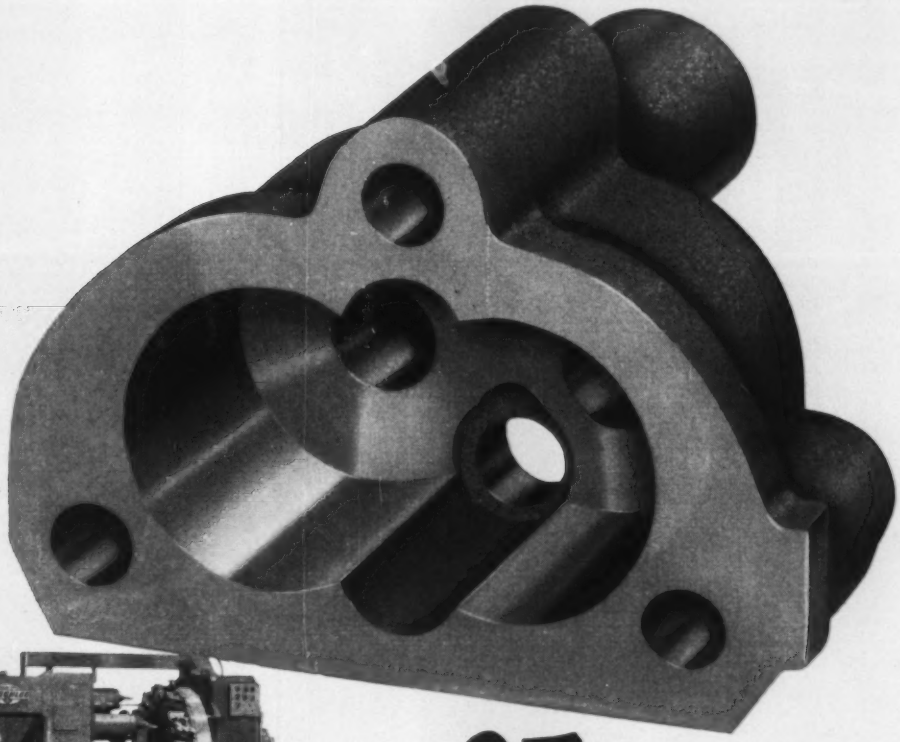
For more data circle No. 49 on postcard, p. 69

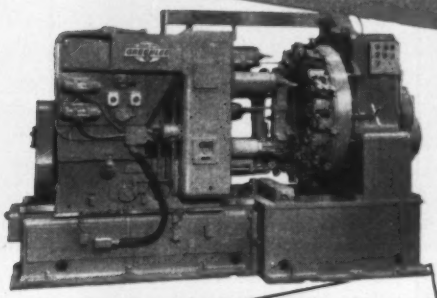
Production Drills

These new 20-in., three- and four-spindle drills are heavier throughout, with production rated capacities of 1⅛ in. in cast iron and ⅞ in. in steel. They're available with a choice of two heavy-duty countershaft drives: A variable-speed unit that lets you change speed while the drill is operating; and step-pulley drives with five or ten speeds. Speeds range from 150-2000 rpm. Other outstanding features include: Choice of gear-driven power feed or hand feed; 4-in. ground-steel columns with ½-in. thick walls; lubricated-for-life ball bearings; machined and balanced pulleys; head positioning mechanism; and ready-to-run motors and switches that are installed, wired and factory-tested. (Clausing Div., Atlas Press Co.)

For more data circle No. 50 on postcard, p. 69

. . . an example of Automatic Production by Greenlee . . .





97 cast iron oil pump bodies an hour

This Greenlee 12-station, horizontal indexing machine rough and finish machines cast iron oil-pump bodies for a leading auto producer at the rate of 97 pieces per hour. Indexing is fully automatic. Cycle time is 37.2 seconds. Tolerances of ± .001" for boring depth and ± .0005" for ream hole size are maintained.

STATION 1 — load, unload
STATION 2 — drill
STATION 3 — drill
STATION 4 — drill, chamfer
STATION 5 — rough bore
STATION 6 — rough ream
STATION 7 — rough bore
STATION 8 — semi-finish bore
STATION 9 — semi-finish bore
STATION 10 — finish ream, finish bore
STATION 11 — finish ream
STATION 12 — finish ream, finish bore

Let a Greenlee representative show you the modern Greenlee cooperative engineering approach to automatic production.

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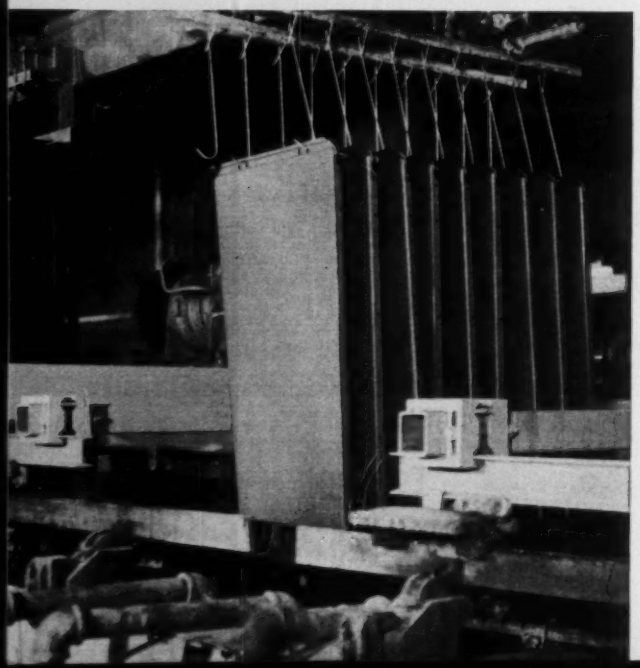
Steel

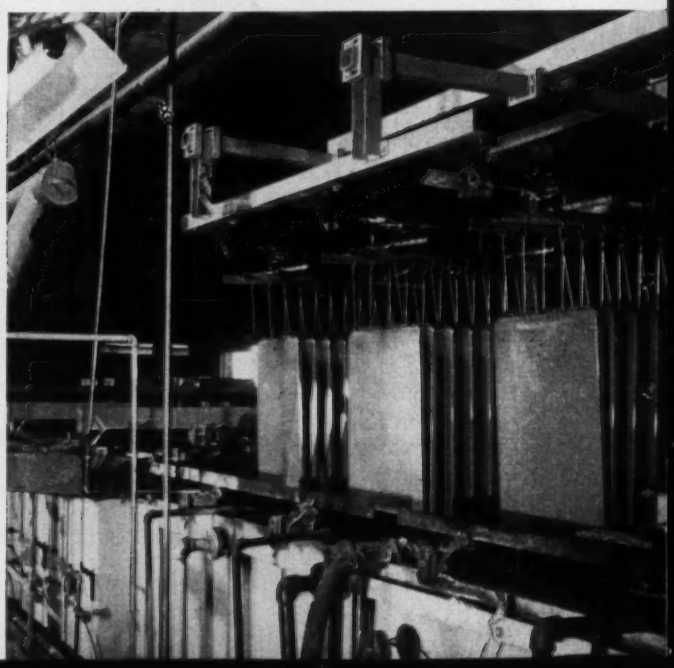
for Strength
. . . Economy
. . . Versatility

Assembly of Roper's 30-inch ranges takes place under modern production conditions. Single-coat finish on Bethnamel panels greatly reduces hazard of chippage during assembly.

Stove side panels 22 1/8 in. x 36 in. receive a 24-minute pickle in 7 to 9 per cent H_2SO_4 at 160-175 deg F. This bath is designed to hold metal removal to a minimum of 2 gr per sq ft.



After thorough rinsing, the Bethnamel panels pass through a 15-min. nickel flash of 150/165 deg F temperature, at an operating pH of about 3.5.



Roper gets 84% acceptance on first fire in direct-on enameling Bethnamel panels

Single coat lowers processing costs, cuts chippage in assembly

At Kankakee, Illinois, the George D. Roper Corp. turns out a range that's a household word among women who cook with gas. To the Roper people the ranges now look better than ever, thanks to their successful direct-on enameling of Bethnamel sheet steel.

One-Coating Cuts Chippage

On white 30-inch models, the side panels are direct-on coated Bethnamel. Roper has attained 84 per cent acceptance of these parts on first fire. They have also found it overcomes the disadvantage of heavy overcoats: it practically ends the chippage of finished panels during assembly.

Another benefit of the direct-on process is the elimination of ground-coat costs, both material and labor. Roper ranges have held full whiteness and opacity with the same titania frit used in conventional ground-and-cover processing.

Roper's success with direct-on is built around a sulphuric acid pickle designed to control metal-removal to as close to 2 grams per square foot as possible. This is followed by nickel flash, then neutralization and drying.

Low Carbon Content Solves Boiling and Fishscaling

Bethnamel, developed by Bethlehem research engineers, has a carbon content of about .003, which wipes out the cause of boiling. It draws beautifully, even in severe operations. In two-coat enameling, it is interchangeable with other sheet metals; conversion to direct-on coating involves only simple and inexpensive modifications in the pickling line. Best of all it costs no more than enameling iron. Let us send you a copy of our Technical Folder 734.

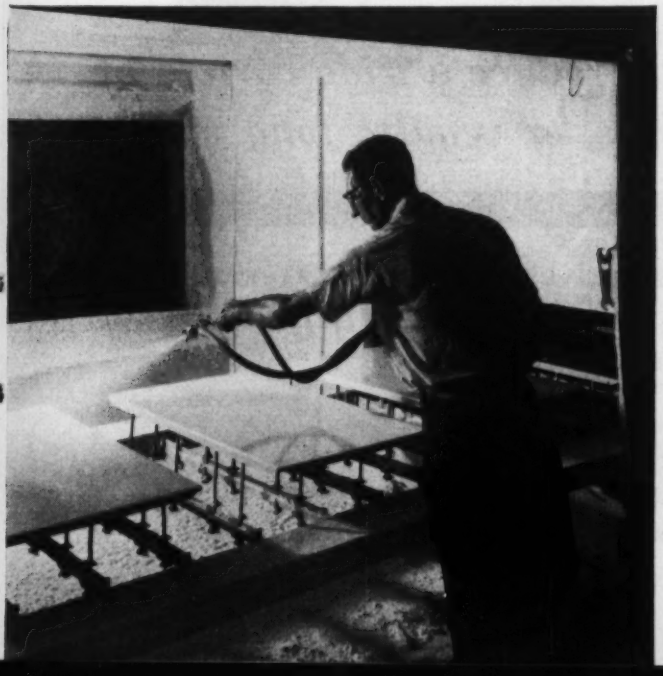
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

Export Sales: Bethlehem Steel Export Corporation

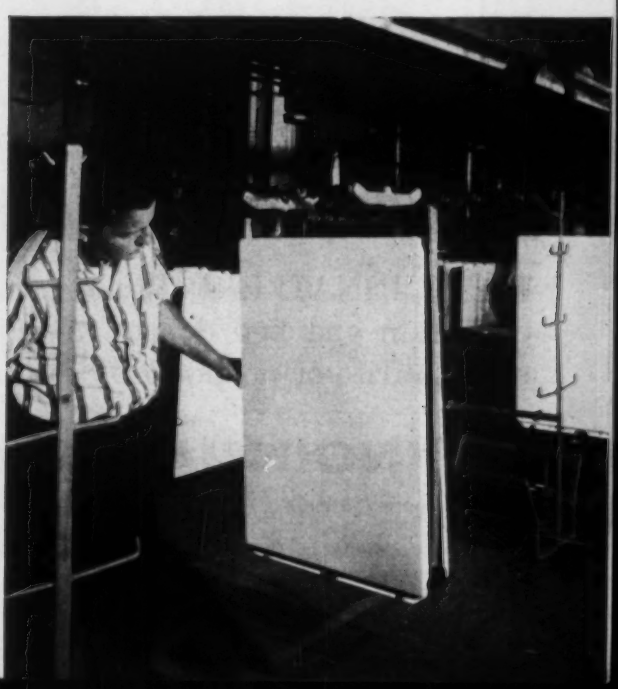
BETHLEHEM STEEL

BETHLEHEM STEEL

The same frit as in two-coat enameling is used in this direct-on enamel operation. Parts are then fired at 1490 deg F for 3 minutes, 20 seconds.



Inspection shows excellent adherence and color. Roper inspectors accept 84 per cent of these panels on first fire.



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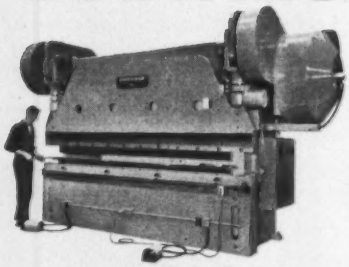

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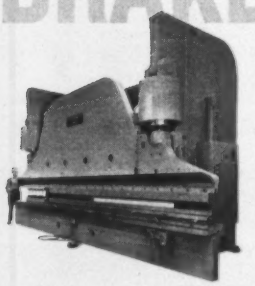

Check these machines if you produce a wide variety of shapes in relatively small lots, or require long stroke.

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Many Steel Products on Quota

A new surge of ordering has placed most flat-rolled steel products on allocation.

All of the orders may not be on the books, but big users have blocked out first-half requirements.

■ Many steel products are on virtual allocation through the first quarter of 1962.

A new surge of orders after Dec. 15 actually confirmed what had been reported weeks earlier; a general uptrend in business, coming on top of a major program of steel strike hedging, would create a vise-tight steel market after the first of the year.

Over Capacity—Some steel companies report orders coming in at a rate well over their capacity. Tightest products are galvanized and cold-rolled sheet, but distribution of all flat-rolled products is under tight control. Mills are very selective about taking orders. Consumers who have relied on shipments from distant mills have been warned they have to get on the books with firm first quarter orders if they want consideration in the second quarter.

Some mills report that orders on the books are not drastically advanced. But this can be misleading. Big customers are placing their orders at a normal lead time. But, they have blocked out longer programs, sometimes as far out as six months.

General Pickup—A major pickup of general steel business is also noted, although the real pressure comes from the big users of flat-rolled products. The picture remains a little spotty, but mills report that advance orders show gains coming for bars, plates, structurals, some tubular products, and rails and wheels.

Among the flat-rolled users, appliance makers, office furniture manufacturers, decking producers, and other manufacturers have all come in for heavy tonnage for February and March. Since most of these consumers have been ordering only a month ahead, this concentration produced a big bulge in the order rates.

Steel service centers have not shared in the upturn in business to the extent noted at the mills. But, doing their own strike hedging, they are stepping up their ordering. It's reported that some Midwestern warehouses are reaching out to Pittsburgh mills for second quarter tonnage.

Adding Furnaces — Throughout the country, mills are adding blast furnaces and steelmaking units as the rate of new orders picks up. Mills are talking about production increases of 15 pct by January. This could bring steelmaking operations up to the mid 80's (as a percent of capacity) with further gains assured.

One way to rate the market's strength will be to watch the rate of steelmaking through the holidays. Traditionally, a small decline indicates a very strong market, as this means mills are willing to pay premium pay to keep up production. Conversely, a sizable drop indicates a weak market.

With the market surging ahead as it is now, there will be little, if any slackening of the production pace through the end of this month. Instead, mills will be willing to work with nearly full crews to maintain production.

District Steel Production Indexes
1957-59=100

	Last Week	Two Weeks Ago	Month Ago	Year Ago
North East Coast	115	113	105	71
Buffalo	116	113	100	60
Pittsburgh	111	105	101	63
Youngstown	100	98	98	58
Cleveland	125	121	108	69
Detroit	153	158	147	74
Chicago	128	126	113	79
Cincinnati	129	135	139	79
St. Louis	130	122	141	75
Southern	111	105	95	83
Western	103	108	107	85
U. S. Index	118.1	115.8	109.3	71.1

Source: American Iron & Steel Institute

Steel Production, Composite Prices

Production	Last Week	Two Weeks Ago	To Date 1961	To Date 1960
(Net tons, 000 Omitted)	2,200	2,158	93,311	95,985
Ingot Index				
(1957-59=100)	118.1	115.8	100.2	103.1
Composite Prices	This Week	Week Ago	Month Ago	Year Ago
Finished Steel base (Cents per lb)	6.196	6.196	6.196	6.196
Pig Iron (Gross ton)	$66.44	$66.44	$66.44	$66.32
Scrap No. 1 hvy (Gross ton)	$34.50	$34.50	$32.83	$28.50
No. 2 bundles	$24.17	$24.17	$22.83	$18.83

Purchasing's Profit Potential

Top management is learning more and more that purchasing can be one method towards greater profits.

Without directly interfering with the buyer, management can call for more emphasis on savings in costs.

■ Is top management taking a closer interest in the profit potential of purchasing?

Management certainly is at one large company. President F. L. Byrom of Koppers Co., Inc., feels the purchasing department is one of the best places to look for added profit dollars.

Executive Cooperation — Addressing a recent meeting of the Purchasing Agents Assn. of Pittsburgh, Mr. Byrom gave his views on why this search was so necessary and on how a top executive should work with buyers.

From an earnings standpoint, he pointed out, $1 saved in purchasing equals $10 in added sales. For Koppers, a 5 pct reduction in purchasing costs would have increased profits 35 pct in a recent year.

Mr. Byrom indicated he was determined to take advantage of these relationships. "I've always thought you could cut anything 10 pct," he said.

Retain Quality — However, he made it clear he did not intend to get involved directly in purchasing details. He emphasized, also, that he was not telling buyers to push for price cuts at the expense of quality and service.

What Mr. Byrom wants is to make each individual in purchasing aware of the contribution he can make to company profits. A big part of the president's job, he feels, is to spread this doctrine through broad personal contact.

F. L. BYROM: Profit may be lurking in the purchasing department.

"The best thing I can do is try and stimulate people," he says.

Practical Policy—It is a mistake, he indicates, for the company president to attempt detailed supervision and to restrict the freedom of lower levels in working out improved methods. In this connection, he points out that one very promising suggestion on field inventories at Koppers came from well down the line: the idea would have appeared impractical to anyone without close working knowledge of distribution mechanics.

Mr. Byrom's drive to promote profitable ideas is explained very simply: Koppers is not making enough money. The company shoots for a profit before taxes of 20 pct. It feels it must pay dividends of at least 5 pct. . . . "Almost anybody can get 4½ pct," says Mr. Byrom, "and have absolutely no risk."

Constant Growth—At least another 5 pct is needed for modernization and growth, he feels. "You just can't quit," he says! "If you decide you're big enough, you're going to wither on the vine. We've got to retain at least half our earnings for growth and replacement."

With 10 pct needed for dividends and capital and another 10 pct for taxes, Koppers feels it must start with a 20 pct margin if it is to survive. The company has not been showing this return in recent years, says Mr. Byrom. He adds that more than half the large corporations in the country are in the same boat.

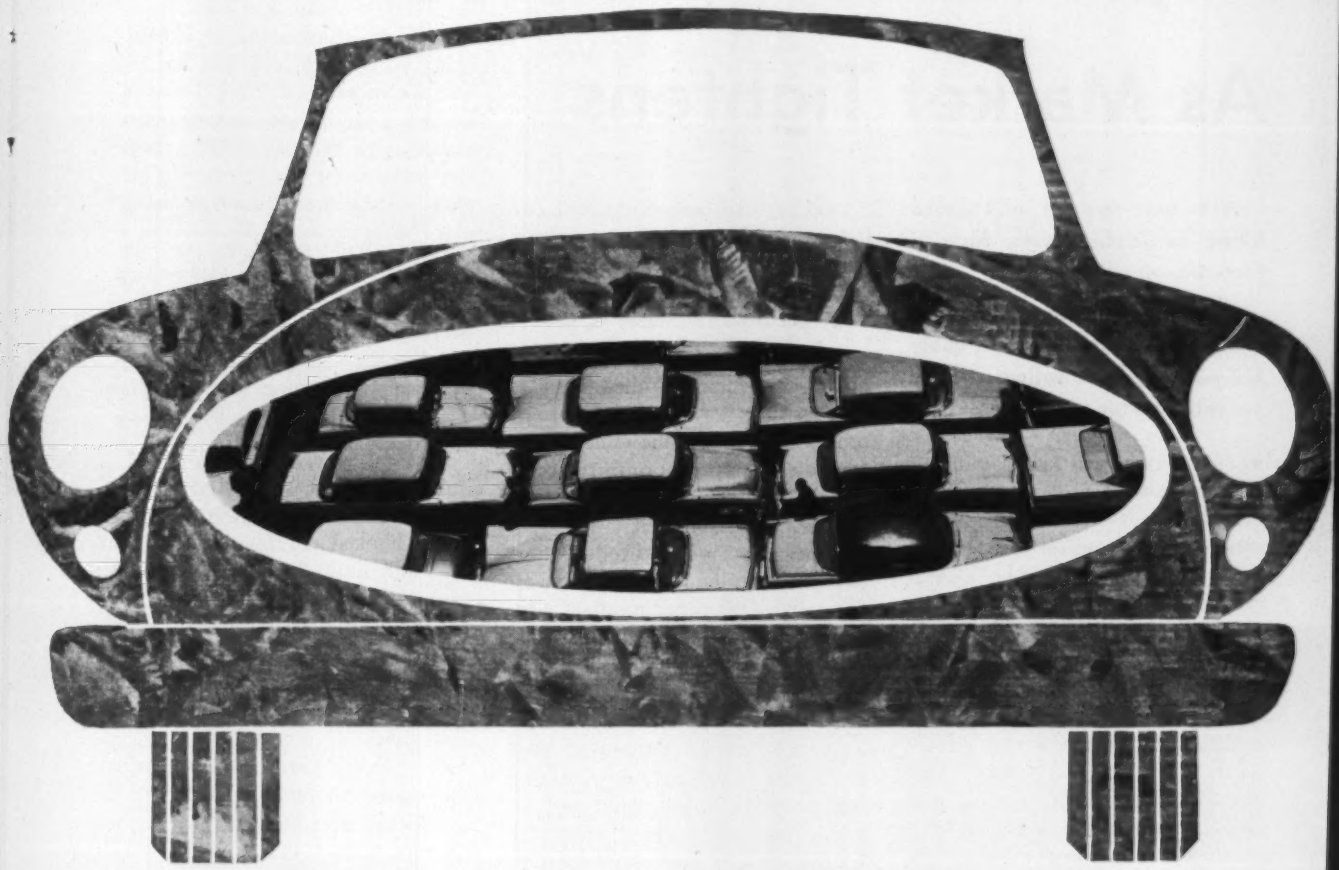
High Return — Koppers' profit push is not restricted to purchasing. Other departments are being given their own cost targets. However, the buying operation has the size to yield a high return on a small percentage saving. Making steel mill equipment, chemicals and coal tar products, Koppers last year spent $184.5 million on outside materials and services. More than half the company's sales dollar went into purchases.

Summing Up—Mr. Byrom's plan to increase profits by having top management take more notice of buying will benefit several groups.

He clearly states that buyers are not to look for price cuts at the expense of quality. And he adds that this path toward greater earnings is best followed by stimulating people rather than by direct supervision of purchasing men.

It is better for each purchasing man to be aware that he can contribute to the company's profit picture.

More parts in more new cars fend off corrosion . . .



GUARDED BY GALVANIZED STEEL

In 1960 the Motor City consumed a massive 218,964 net tons of galvanized steel sheets to fight car corrosion. That's 38% more than was used in 1959 and over 700% more than in 1954.

In the average compact car, for instance, Detroit now uses over 100 pounds of corrosion-resistant galvanized steel sheets. The results are numerous and notable: Car owners are getting greater durability and a sharp drop in maintenance costs and headaches. Manufacturers are getting the cost reductions inherent in galvanized steel's simplified fabricating procedures. Head and tail lamp housings, for instance, formerly required five or six steps when zinc plated or painted after stamping. Now they are moved direct from press to assembly line with their tight zinc coatings completely undamaged by fabrication. The same economies apply to side members, rocker panels, front and rear rails and cross members.

WEIRKOTE,® IN PARTICULAR! Widely used Weirkote is a natural for automotive applications, and the auto industry has been quick to put it to extensive use. To the inherent strength, economy and versatility of steel, Weirkote adds enduring zinc protection that can be worked to the very limits of the steel base without chipping or peeling. This superior product is the end result of years of experience and technical research devoted to coating steel sheets with zinc. Weirkote is manufactured by two National Steel divisions, Weirton Steel and Midwest Steel. Write Weirton Steel Company, Weirton, West Virginia, for further details.

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Buyers Plan Ahead As Market Tightens

With first quarter mill books filling in fast, buyers face a fast-changing market.

More are planning ahead to make sure of supplies. First quarter pinch will be followed by a second quarter squeeze.

▪ Steel buyers will face a radically different market next month. With mill bookings and shipments increasing, the squeeze will be on. Delivery estimates will be moving out. Some cases of delivery delays are already showing up.

As a result, more customers are altering their buying plans. More are placing orders to give the mills the normal lead times needed to process steel. This is a big change from previous patterns of ordering only about a month or less ahead.

Some mills are urging distant customers to block in first quarter tonnages so they can place second quarter tonnages without difficulty. By the second quarter a real delivery squeeze should develop.

Months Ahead—Buyers, in turn, are planning further ahead. Some are getting in tonnages for second quarter delivery as far ahead as June. Warehouses are stepping up tonnage at a sharp rate. They are booking sheets, bar, and to some extent, plates and shapes.

All this means first quarter books for virtually all products will be fat. What's going to happen can be seen by market comments on wire, long a slow-moving product. Some buyers are booked through June. This is a welcome change for wire mill salesmen who've been getting orders only a week or two before required delivery. Some sources say January-February orders are coming in so well wire mill output will jump 15 to 20 pct from December levels.

Sheet and Strip—There was an order surge for cold-rolled sheet as the deadline for placing February orders arrived. Some automakers translated informal commitments into firm orders. At the same time they increased tonnages.

Other users of cold-rolled sheet also joined in the rush. Virtually all big users of flat-rolled products have come in with six-month ordering programs, a **Pittsburgh** mill executive reports. Actual orders are being placed at normal mill lead dates.

At **Cleveland,** cold-rolled sheet for January and February delivery will probably be just about sold out when all auto orders come in. Coated grades and those needing special annealing or other treatment are on extended delivery.

Further west at **Chicago,** sheet continues to be the most wanted product. Mills are just about cleaned out on galvanized and tinplate. This also is true, in some cases, for hot-rolled sheet and cold-rolled strip.

PURCHASING AGENT'S CHECKLIST

What's behind U.S. Steel's new method of pricing high strength steels? P. 29

Treasury Secretary Dillion discusses the important issue of depreciation reform. P. 37

Carbide bearings curb wear in pump operation. P. 57

Galvanized—Mill allotments are showing up in galvanized. The best delivery some users at **Pittsburgh** can get is late February. The sales strength of galvanized is unusual because this is normally the off-season for this product.

Tinplate—Buyers are also developing purchasing programs for the first six months of '62. However, several of the largest can companies are delaying this move. The problem seems to be how much thin tinplate will be needed and available.

Plate—Wide plates are sold out through January at two **Midwestern** mills. At other locations and on an overall basis, plates are not particularly strong. As an example, one producer is running at 65 to 70 of capacity. The linepipe market, is virtually lifeless.

Bars—Orders are moving up well. Some **Cleveland** area mills are just about booked out for January. A few with limited capacity are sold out through February. It's expected auto industry steel buyers will soon tell forging suppliers to start stocking up on bar. This will help extend lead times. Traditionally bar lead times are longer than in sheet and mill semi-finished inventories are harder to build up.

Chicago area bar mills, even at a 20-turn a week operating rate, are having some trouble meeting shipping promises. They continue talking about a 30-45 day order cycle, but customers say the delays push some deliveries out to 60 days.

Ferromanganese Prices — Last week Tennessee Products and Chemical Corp. reduced the base prices of standard ferromanganese and silicomanganese. The company's new base bulk prices of 74-76 pct standard high-carbon ferromanganese is 9.5¢ a lb of alloy. The new base bulk prices for silicomanganese are 10.1¢ a lb of alloy for 3 pct carbon grade; 10.3¢ for 2 pct carbon grade; and 10.6¢ for the 1.5 pct carbon grade.

Later in the week some producers announced they would meet the new prices.

COMPARISON OF PRICES

(Effective December 18, 1961)

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Price changes from previous week are shown by an asterisk (*).

	Dec. 18 1961	Dec. 11 1961	Nov. 17 1961	Dec. 20 1960
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	5.10¢
Cold-rolled sheets	6.275	6.275	6.275	6.275
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.875
Hot-rolled strip	5.10	5.10	5.10	5.10
Cold-rolled strip	7.425	7.425	7.425	7.425
Plate	5.30	5.30	5.30	5.30
Plates, wrought iron	14.10	14.10	14.10	14.10
Stainl's C-R strip (No. 302)	49.50	49.50	49.50	52.00
Tin and Terneplate: (per base box)				
Tin plates (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.65
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.35
Special coated mfg. ternes	9.90	9.90	9.90	9.90
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	5.675¢	5.675¢	5.675¢
Cold finished bar	7.65	7.65	7.65	7.65
Alloy bar	6.725	6.725	6.725	6.725
Structural shapes	5.50	5.50	5.50	5.50
Stainless bars (No. 302)	46.75	46.75	46.75	46.75
Wrought iron bars	14.90	14.90	14.90	14.90
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	8.00¢
Rails: (per 10 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.75
Light rails	6.725	6.725	6.725	6.725
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$80.00
Slabs, rerolling	80.00	80.00	80.00	80.00
Forging billets	99.50	99.50	99.50	99.50
Alloys, blooms, billets, slabs	119.00	119.00	119.00	119.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.49¢	6.49¢	6.49¢	6.40¢
Skelp	5.05	5.05	5.05	5.05
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	6.196¢

	Dec. 18 1961	Dec. 11 1961	Nov. 17 1961	Dec. 20 1960
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.68	$70.68	$70.68	$70.11
Foundry, South Cinn.	71.92	71.92	71.92	71.92
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd. Philadelphia	70.11	70.11	70.11	69.61
Basic Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese 74-76 pct Mn. Cents per lb‡	9.5-11.00	11.00	11.00	11.00
Pig Iron Composite: (per gross ton)				
Pig Iron	$66.44	$66.44	$66.44	$66.32
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	$35.50	$35.50	$33.50	$26.50
No. 1 steel, Phila. area	33.50	33.50	33.50	33.50
No. 1 steel, Chicago	34.50	34.50	31.50	25.50
No. 1 bundles, Detroit	32.50*	31.50	29.50	21.50
Low phos., Youngstown	37.50	37.50	36.50	28.50
No. 1 mach'y cast., Pittsburgh	44.50	44.50	44.50	44.50
No. 1 mach'y cast., Phila.	47.50	47.50	47.50	47.50
No. 1 mach'y cast., Chicago	46.50	46.50	44.50	41.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	$34.50	$34.50	$32.83	$28.50
No. 2 bundles	24.17	24.17	22.83	18.83
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.75-15.50	14.75-15.50	14.75-15.50	14.75-15.50
Foundry coke, prompt	18.50	18.50	18.50	18.50
Nonferrous Metals: (cents per pound to large buyers)				
Copper electrolytic, Conn.	$31.00	$31.00	$31.00	$30.00
Copper Lake, Conn.	31.00	31.00	31.00	30.00
Tin, Straits, N. Y.	121.125†	121.25	123.625	101.50
Zinc, East St. Louis	12.00	12.00	11.50	12.50*
Lead, St. Louis	10.05	10.05	9.80	11.00*
Aluminum, ingot	24.00	24.00	24.00	26.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index of steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composite

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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MACHINE MANUFACTURING CO.
PITTSBURGH 33, PA.
Write for Bulletin 314-A

Market on Rebound Across the Country

Prices are firm to rising in Midwest and Far West. East Coast reported generally stable.

Firmness is based on predictions that demand will pick up in the first quarter of 1962.

■ Scrap prices continue to inch upwards on the West Coast and in the Midwest. The market on the East Coast continues firm, but generally hasn't started to rebound.

Cincinnati and Detroit spearheaded the drive in the Midwest. On the West Coast, San Francisco, Los Angeles, and Seattle report rising prices.

Eastern firmness is based on anticipation. Pittsburgh is awaiting an upsurge of demand; Philadelphia is stable; in New York, prices are held level by export buying.

Export is also important in the Far West where the next Japanese move is awaited. A show of Mexican buying was felt recently in Houston but it wasn't strong enough to change the status.

Railroad grades are showing some movement in Philadelphia, Chicago, and Cincinnati. Melting grades are strengthening on the West Coast and in Detroit and Cincinnati.

Supply is tightening as dealers and brokers wait for increased activity. The big question is how soon will it come. There is much optimism for the first quarter of 1962, but performance will now have to match prospects.

Price stability is again reflected in The Iron Age composite prices. For the second straight week, No. 1 heavy melting is at $34.50 and No. 2 bundles are at $24.17.

Pittsburgh—The market here is quiet and steady. Anticipation by dealers of increased demand has tightened scrap supply. However, there is still not enough buying for this to force higher prices. One mill is holding to a price of $25 for No. 2 bundles. With other consumers out of the market, this figure apparently is producing enough tonnage for the mill's needs. The only buyer of No. 1 heavy melting is paying $36 to the dealer for shipment to a plant on the fringe of the district. The biggest users in this area have made no move to build scrap inventory. Brokers could only guess when current requirements would force general tonnage buying.

Chicago—Local markets dried up as dealer resistance to present price offers strengthened. Mills continue to hold back, which has limited gains to scattered grades along the list, but the entire December-January outlook is now regarded as very strong.

Low phos. 2 ft. was incorrectly listed in the issue of Dec. 14. The correct price should have been $43.00 to 44.00.

Philadelphia — The market remains stable. But export prices are weaker. Three ships were loaded this week at $2.50 above the domestic price, or 50¢ below the prevailing level. With this development, some dealers are resigned to slow but steady business until mid-January, at the earliest. Others count on heavy tonnage demand from the mills to spur a pickup. Some mills haven't bought since September. If rush orders for heavy tonnage develop, prices will move up again.

New York—Dealers say export orders are hard to find. Exporters are shopping for bargains, but there is enough buying for overseas shipment to hold current prices steady.

Detroit — Differences of opinion between buyers and sellers is enough to impede trading. On appraisal, the market is strong and seems to be growing a bit stronger but it is hard to judge how much. Mill operations in Detroit are picking up. Exporters aren't buying much and there is not much interest by Canadians, although this segment may come alive after the first of the year.

Cleveland — Market is increasingly bullish, but there are still no major orders for dealer scrap around. Dealers will sell only small amounts and brokers have had to increase prices in covering tail-ends of old orders.

Cincinnati—Brokers have had to raise buying prices generally $1 on No. 1 grades to cover December orders and outlook is for some additional increase for next month.

St. Louis — Prices remain unchanged. The market has ground to a halt as the holiday season nears. Dealing is very slow.

Birmingham — Prices have remained the same. There is a little movement in the market, most of it in small quantities.

Buffalo—There is a better tone to the market this week. Dealers look to increased movement of scrap to the mills as steel production is stepped up. Prices are unchanged.

Boston—The market is growing stronger and some optimism is based on two price rises.

Houston — The market is quiet and all indications are it will remain so through December.

West Coast—The market keeps inching up. In Los Angeles, San Francisco and Seattle, prices are better. Export is still at a snail's pace.

SCRAP PRICES *(Effective December 18, 1961)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$35.00 to $36.00
No. 2 hvy melting	28.00 to 29.00
No. 1 dealer bundles	36.00 to 37.00
No. 1 factory bundles	41.00 to 42.00
No. 2 bundles	25.00 to 26.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	15.00 to 16.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	19.00 to 20.00
Low phos. punch'gs plate	42.00 to 43.00
Heavy turnings	29.00 to 30.00
No. 1 RR hvy. melting	40.00 to 41.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	49.00 to 50.00
RR specialties	47.00 to 48.00
No. 1 machinery cast.	44.00 to 45.00
Cupola cast.	36.00 to 37.00
Heavy breakable cast.	30.00 to 31.00
Stainless	
18-8 bundles and solids	180.00 to 185.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	80.00 to 85.00
410 turnings	50.00 to 55.00

Chicago

No. 1 hvy. melting	$34.00 to $35.00
No. 2 hvy. melting	32.00 to 33.00
No. 1 dealer bundles	35.00 to 36.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	24.00 to 25.00
No. 1 busheling	34.00 to 35.00
Machine shop turn.	19.00 to 20.00
Mixed bor. and turn.	21.00 to 22.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	21.00 to 22.00
Low phos. forge crops	45.00 to 46.00
Low phos. punch'gs plate, ¼ in. and heavier	45.00 to 46.00
Low phos. 2 ft and under	43.00 to 44.00
No. 1 RR hvy. melting	37.00 to 38.00
Scrap rails, random lgth.	44.00 to 45.00
Rerolling rails	57.00 to 59.00
Rails 2 ft and under	50.00 to 51.00
Angles and splice bars	43.00 to 44.00
RR steel car axles	56.00 to 57.00
RR couplers and knuckles	43.00 to 44.00
No. 1 machinery cast.	46.00 to 47.00
Cupola cast.	40.00 to 41.00
Cast iron wheels	35.00 to 36.00
Malleable	45.00 to 46.00
Stove plate	34.00 to 35.00
Steel car wheels	42.00 to 43.00
Stainless	
18-8 bundles and solids	185.00 to 190.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	100.00 to 105.00
430 turnings	65.00 to 70.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	35.00 to 36.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	11.00 to 13.00
Mixed bor. short turn.	12.00 to 13.00
Cast iron borings	12.00 to 13.00
Shoveling turnings	19.00 to 20.00
Clean cast. chem. borings	27.00 to 28.00
Low phos. 5 ft and under	37.00 to 38.00
Low phos. 2 ft punch'gs	39.00 to 40.00
Elec. furnace bundles	36.00 to 37.00
Heavy turnings	27.00 to 28.00
RR specialties	42.00 to 43.00
Rails, 18 in. and under	48.00 to 49.00
Cupola cast.	37.00 to 38.00
Heavy breakable cast.	38.00 to 39.00
Cast iron car wheels	40.00 to 41.00
Malleable	47.00 to 48.00
No. 1 machinery cast.	47.00 to 48.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.50 to $34.50
No. 2 hvy. melting	26.00 to 27.00
No. 1 dealer bundles	34.50 to 35.50
No. 2 bundles	18.00 to 19.00
Machine shop turn.	9.00 to 10.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Low phos. 18 in. and under	41.00 to 42.00
Rails, random length	42.00 to 43.00
Rails, 18 in. and under	48.00 to 49.00
No. 1 cupola cast.	34.00 to 35.00
Heavy breakable cast.	29.00 to 30.00
Drop broken cast.	44.00 to 45.00

Youngstown

No. 1 hvy. melting	$36.00 to $37.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	24.00 to 25.00
Machine shop turn.	17.00 to 18.00
Shoveling turnings	19.00 to 20.00
Low phos. plate	37.00 to 38.00

Cleveland

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	33.00 to 34.00
No. 1 factory bundles	36.00 to 37.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	14.00 to 15.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Cut structural & plates, 2 ft & under	39.00 to 40.00
Low phos. punch'gs plate	34.00 to 35.00
Drop forge flashings	33.00 to 34.00
Foundry steel, 2 ft & under	34.50 to 35.50
No. 1 RR hvy. melting	38.00 to 39.00
Rails 2 ft and under	49.00 to 50.00
Rails 18 in. and under	50.00 to 51.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	44.00 to 45.00
No. 1 machinery cast.	45.00 to 46.00
Stove plate	37.00 to 38.00
Malleable	48.00 to 49.00
Stainless	
18-8 bundles	160.00 to 165.00
18-8 turnings	95.00 to 100.00
430 bundles	75.00 to 80.00

Buffalo

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	24.00 to 25.00
No. 1 busheling	27.00 to 28.00
No. 1 dealer bundles	27.00 to 28.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	12.00 to 13.00
Mixed bor. and turn.	13.00 to 14.00
Shoveling turnings	16.00 to 17.00
Cast iron borings	14.00 to 15.00
Low phos. plate	33.00 to 34.00
Structural and plate, 2 ft and under	35.00 to 36.00
Rails 2 ft and under	46.00 to 47.00
Scrap rails, random lgth.	36.00 to 37.00
No. 1 machinery cast.	43.00 to 44.00
No. 1 cupola cast.	37.00 to 38.00

St. Louis

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	27.00 to 28.00
Foundry steel, 2 ft.	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	15.50 to 16.50
Shoveling turnings	17.50 to 18.50
Cast iron borings	21.00 to 22.00
No. 1 RR hvy. melting	35.00 to 36.00
Rails random lengths	39.00 to 40.00
Rails, 18 in. and under	43.00 to 44.00
RR specialties	39.00 to 40.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	31.00 to 32.00
Cast iron car wheels	33.00 to 34.00
Rerolling rails	53.00 to 54.00
Unstripped motor blocks	33.00 to 34.00

Birmingham

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	23.00 to 24.00
No. 1 dealer bundles	33.00 to 34.00
No. 2 bundles	20.00 to 21.00
No. 1 busheling	36.00 to 37.00
Machine shop turn.	16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	9.00 to 10.00
Electric furnace bundles	36.00 to 37.00
Elec. furnace, 3 ft & under	34.00 to 35.00
Bar crops and plate	42.00 to 43.00
Structural and plate, 2 ft.	41.00 to 42.00
No. 1 RR hvy. melting	34.00 to 35.00
Scrap rail, random lgth.	40.00 to 41.00
Rails, 18 in. and under	44.00 to 46.00
Angles and splice bars	44.00 to 45.00
No. 1 cupola cast.	40.00 to 41.00
Stove plate	40.00 to 41.00
Cast iron car wheels	34.00 to 35.00
Unstripped motor blocks	30.00 to 31.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$27.00 to $28.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	15.00 to 16.00
Mixed bor. and turn.	5.00 to 6.00
Machine shop turnings	5.00 to 6.00
Shoveling turnings	7.00 to 8.00
Clean cast. chem. borings	17.00 to 18.00
No. 1 machinery cast.	36.00 to 37.00
Mixed yard cast.	32.00 to 33.00
Heavy breakable cast.	30.00 to 31.00
Stainless	
18-8 prepared solids	150.00 to 155.00
18-8 turnings	75.00 to 80.00
430 prepared solids	55.00 to 60.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$30.00 to $31.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 dealer bundles	32.00 to 33.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	29.00 to 30.00
Drop forge flashings	28.00 to 29.00
Machine shop turn.	10.00 to 11.00
Mixed bor. and turn.	14.00 to 15.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	14.00 to 15.00
Heavy breakable cast.	29.00 to 30.00
Mixed cupola cast.	32.00 to 33.00
Automotive cast.	42.00 to 43.00
Stainless	
18-8 bundles and solids	170.00 to 175.00
18-8 turnings	75.00 to 80.00
430 bundles and solids	65.00 to 70.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	17.00 to 18.00
No. 1 dealer bundles	26.00 to 27.00
No. 2 bundles	15.00 to 16.00
No. 1 busheling	26.00 to 27.00
Machine shop turn.	3.00 to 4.00
Shoveling turnings	8.00 to 9.00
Clean cast. chem. borings	15.50 to 16.50
No. 1 machinery cast.	38.00 to 39.00
Mixed cupola cast.	29.00 to 30.00
Heavy breakable cast.	27.00 to 28.00

San Francisco

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	27.00
No. 1 dealer bundles	22.00
No. 2 bundles	20.00
Machine shop turn.	12.00
Cast iron borings	12.00
No. 1 cupola cast.	$44.00 to 45.00

Los Angeles

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	22.00
No. 2 bundles	20.00 to 21.00
Machine shop turn.	12.00
Shoveling turnings	12.00
Cast iron borings	12.00
Elec. furnace 1 ft and under (foundry)	42.00 to 43.00
No. 1 cupola cast.	42.00 to 43.00

Seattle

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	$27.00 to 28.00
No. 2 bundles	20.00 to 21.00
No. 1 cupola cast.	34.00
Mixed yard cast.	29.00

Hamilton, Ont.

Brokers buying prices per net ton on cars:

No. 1 hvy. melting	$27.00
No. 2 hvy. melting cut 3 ft and under	21.50
No. 1 dealer bundles	28.00
No. 2 bundles	21.50
Mixed steel scrap	19.00
Bush., new fact., prep'd.	27.00
Bush., new fact., unprep'd.	22.00
Machine shop turn.	8.00
Short steel turn.	12.00
Mixed bor. and turn.	12.00
Cast scrap	32.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$33.00
No. 2 hvy. melting	30.00
No. 2 bundles	21.00
Machine shop turn.	12.00
Shoveling turnings	15.00
Cut structural plate 2 ft & under	$42.00 to 43.00
Unstripped motor blocks	28.00 to 29.00
Cupola cast.	34.00 to 35.00
Heavy breakable cast.	28.00 to 29.00

How Congo Struggle Affects Markets

Congo fighting threatens production and eventual fate of Katanga mining operations.

Other minerals abound in rich Congo province.

■ Katanga's importance to the Congo is based strongly on its mineral wealth. While the fighting rages, the political issues get prime attention. But, meanwhile, the future of Katanga's rich mineral deposits remains unsolved.

That cannot be settled, of course, until peace returns permanently to Katanga and the Congo in general. At present, the bid of Katanga's president Moise Tshombe for secession from the Republic of the Congo has confused mineral operations.

Operations Threatened — Last week fighting crackled near the Katangan copper refining operations. The Union Miniere du Haut Katanga protested to the UN about its bombing in the area of an electrolytic refinery at Luilu.

Union Miniere, which operates Katanga's mining and refining complex, has a diverse managing group. Ownership is held this way: The Societe Generale de Belgique, a Belgian holding company, controls about 4.6 pct of the stock; Tanganyika Concessions, Ltd., a British concern, holds 14.4 pct; another Belgian company, Compagnie du Katanga, controls 8.7 pct.

Ownership of the remaining shares is most interesting. Almost 54 pct is held by 120,000 individual shareholders in Belgium and France. The Belgian investors outnumber the French about 3 to 1. A critical 18.1 pct is held in trust for the Congolese. Under the terms of present agreements, dividends from these shares go to the Tshombe regime in Katanga.

Political Ties — Virtually all of the Congo's mineral wealth is located in Katanga. But considering the Congo as a whole, the mineral wealth cannot be separated from politics.

Here's why: The area is a major source of copper. Last year Katanga accounted for over 300,000 metric tons of blister and refined copper. This was about 8 pct of the world's copper output. Between 1952-1959 copper production in the Congo rose almost 40 pct.

Copper is far from being the Congo's only source of underground wealth. Zinc is another product with about 120,000 short tons produced in 1960. Last year the Congo produced about 9100 short tons of cobalt. This was more than half of the world's output of 17,000 short tons.

Other minerals are present—gold, silver, tin, cadmium, germanium, and radium. The new nation supplies a major portion of the world's supply of radium.

Custom Smelters

The secondary metals industry can expect a 3 to 5 pct improvement in business in '62.

That's the prediction of Ben Kaufman, Ajax Metal Div. of H. Kramer & Co., Philadelphia. He outlines the prospect by products this way in the Review and Outlook issue of the National Assn. of Secondary Material Industries.

Brass and Bronze Ingots: "The 1962 outlook appears for more favorable conditions in the industry. Two factors, however, could be disruptive: (1) If Japan goes on a wild buying spree; or (2) termination of copper producer labor contracts at mid-year.

Lead—"The outlook during '62 is one of oversupply, even though consumption should show some improvement if industrial activity continues to move upward. . . .

Zinc—"Last year scrap diecast and zinc metals were in short supply due to low-priced scrap iron and resulting lack of sortation. In 1962, scrap zinc and diecast will continue to be scarce. It's hoped there will be an increase in the domestic slab market."

Aluminum Extrusions

It was incorrectly stated here last week that prices for aluminum extrusions had been reduced. The reduction was in ingots or billets sold to extruders.

While there was a direct price reduction of .2¢ a lb by aluminum producers, extruders could get the full reduction of 1.2¢ a lb only by agreeing not to toll scrap.

Tin Prices for the Week

Dec. 12—121.125; Dec. 13—120.875; Dec. 14—120.875; Dec. 15—121.00; Dec. 18—121.125*. *Estimate.

Primary Prices

(cents per lb.)	current price	last price	date of change
Aluminum Ingot	24.00	26.00	9/25/61
Copper (E)	31.00	30.00	5/16/61
Copper (CS)	31.00	30.00	5/17/61
Copper (L)	31.00	30.00	5/17/61
Lead, St. L.	10.05	9.80	11/30/61
Lead, N. Y.	10.25	10.00	11/30/61
Magnesium Ingot	36.00	34.50	8/13/56
Magnesium pig	35.25	33.75	8/13/56
Nickel	81.25	74.00	6/30/61
Titanium sponge	150-160	162-182	8/1/59
Zinc, E. St. L.	12.00	11.50	11/30/61
Zinc, N. Y.	12.50	12.00	11/30/61

ALUMINUM: 99% Ingot. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. Other primary prices, pg. 105.

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. customer's plant)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.030-.037	.047-.060	.076-.096	.154-.250
1100, 3003	47.4	46.4	45.4	44.4
5052	54.8	52.0	49.8	46.8
6061-0	53.0	50.3	48.4	47.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
1-17	45.3-46.8	54.0-61.8
18-32	45.8-47.5	58.6-81.5
33-38	49.5-52.2	85.1-96.6
39-44	59.8-63.6	102.0-124.0

Screw Machine Stock—2011-T-3

Size"	7/32-5/16	11/32-23/32	3/4-1 1/16	1 3/32-1 1/2
Price	60.0	59.2	57.7	55.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.506	$2.013	$2.515	$3.017

MAGNESIUM

(F.o.b. shipping pt., carload frt. allowed)

Sheet and Plate

Type↓ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	96.9	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	147	126	145
Strip, CR	133	114	145
Rod, bar, HR	116	95	116
Angles, HR	116	95	116
Plates, HR	139	116	133
Shot, blocks	...	93	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	56.13	.....	53.61	57.32
Brass, Yellow	49.27	49.56	49.21	53.43
Brass, Low	53.15	52.44	52.09	56.21
Brass, Rod	53.17	53.46	53.11	57.23
Brass, Naval	53.94	60.25	47.75	58.10
Munts Metal	51.94	.....	47.25	.....
Comm. Bs.	54.73	55.02	54.67	58.34
Mang. Bs.	57.71	61.54	51.27	.....
Phos. Bs. 5%	76.97	76.72	77.47	78.90

Free Cutting Brass Rod 34.77

TITANIUM

(Base 30,000 lb, f.o.b. customer's plant)

Sheet and strip, commercially pure, $6.00-$15.00; alloy, $13.40-$17. Plate HR, commercially pure, $5.25-$9.00; alloy, $8.00-$10.00. Wire, rolled and/or drawn, commercially pure, $5.55-$6.05; alloy, $5.55-$9.00; bar, HR or forged commercially pure, $3.60-$4.00; alloy, $4.00-$6.25; billets, HR, commercially pure, $3.20-$3.70; alloy, $3.20-$4.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 32.50
Beryllium Aluminum 5% Be, Dollars per lb contained Be ..... $ 5.00
Beryllium copper, per lb conta'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $70.00
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.70
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic base.... $ 1.31
Cobalt, 97-99% (per lb)... $1.50 to $ 1.57
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 29.95¢ to 36.95¢
Gold, U. S. Treas., per troy oz..... $35.00
Indium, 99.9% dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ....$70 to $75
Lithium, 98% ..... $9.00 to $12.00
Magnesium sticks, 10,000 lb..... 57.00
Mercury dollars per 76-lb flask f.o.b. New York ..... $188 to $191
Nickel oxide sinter at Buffalo, N. Y. or other U. S. points of entry, contained nickel 77.50
Palladium, dollars per troy oz..$24 to $26
Platinum, dollars per troy oz....$82 to $85
Rhodium ..... $137 to $140
Silver ingots (¢ per troy oz.) 104.75
Thorium, per kg $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 32.00
- No. 120 ..... 31.25
- No. 123 ..... 30.50

80-10-10 ingot
- No. 305 ..... 36.00
- No. 315 ..... 33.75

88-10-2 ingot
- No. 210 ..... 43.75
- No. 215 ..... 40.50
- No. 245 ..... 35.75

Yellow ingot
- No. 405 ..... 27.50

Manganese bronze
- No. 421 ..... 31.25

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95.5 aluminum-silicon alloys
- 0.30 copper max. 22.75-23.25
- 0.60 copper max. 22.50-23.00

Piston alloys (No. 132 type)... 24.00-25.00
No. 12 alum. (No. 2 grade)... 20.75-21.25
108 alloy 21.25-21.75
195 alloy 23.75-24.25
13 alloy (0.60 copper max.).. 22.50-23.00
AXS-679 (1 pct zinc) 21.00-22.00

Steel deoxidizing aluminum notch bar granulated or shot
Grade 1—95-97½% 22.75-23.75
Grade 2—92-95% 21.50-22.50
Grade 3—90-92% 20.50-21.50
Grade 4—85-90% 19.50-20.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27	
Yellow brass	20⅝	18½
Red brass	23⅞	23⅛
Comm. bronze	24¾	24
Mang. bronze	19¼	
Free cutting rod ends		18½

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 25½
Light copper 23½
*Refining brass 24¼
Copper bearing material 23¼
* Dry Copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire 27½
No. 2 copper wire 25½
Light copper 23½
No. 1 composition 24½
No. 1 comp. turnings 23¾
Hvy. yellow brass solids 17½
Heavy yellow brass turnings. 16½
Radiators 20¼

Aluminum

Mixed old cast. ..... 11½—12
Mixed new clips ..... 13½—14
Mixed turnings, dry ..... 12½—13

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire ..... 23½—24
No. 2 copper wire ..... 21½—22
Light copper ..... 19¼—19¾
Auto radiators (unsweated) . 16 —16½
No. 1 composition ..... 20 —20½
No. 1 composition turnings.. 19½—20
Cocks and faucets ..... 16½—17
Clean heavy yellow brass ... 14¼—14½
Brass pipe ..... 16¼—16¾
New soft brass clippings .... 17¾—18¼
No. 1 brass rod turnings .... 15½—16

Aluminum

Alum. pistons and struts .... 6½— 7
Aluminum crankcase ..... 9 — 9½
1100 (2s) aluminum clippings 11¼—11¾
Old sheet and utensils ..... 9 — 9½
Borings and turnings ..... 4¼— 4¾
Industrial castings ..... 8¾— 9¼
2020 (24s) clippings ..... 10 —10½

Zinc

New zinc clippings ..... 5 — 5¼
Old zinc ..... 3 — 3¼
Zinc routings ..... 1¾— 2
Old die cast scrap ..... 1¾— 2

Nickel and Monel

Pure nickel clippings ..... 56 —58
Clean nickel turnings 43
Nickel anodes ..... 60 —62
Nickel rod ends ..... 56 —58
New Monel clippings 42
Clean Monel turnings ..... 22 —24
Old sheet Monel 30
Nickel silver clippings, mixed..... 20
Nickel silver turnings, mixed. 16

Lead

Soft scrap lead ..... 6¼— 6½
Battery plates (dry) ..... 2 — 2¼
Batteries, acid free ..... 1¼— 1½

Miscellaneous

Block tin ..... 90 —92
No. 1 pewter ..... 64 —66
Auto babbitt ..... 45 —46
Mixed common babbitt ..... 9½—10
Solder joints ..... 13¾—14¼
Small foundry type ..... 8 —8½
Monotype ..... 8¼— 8¾
Lino. and stereotype ..... 7½— 7¾
Electrotype ..... 7 — 7¼
Hand picked type shells .... 5¼— 5¾
Lino. and stereo. dross ..... 1 — 1½
Electro dross ..... 1¾— 2¼

(Effective Dec. 18, 1961)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PIL-ING	SHAPES, STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi. Str.† H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3,*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$99.50 *A2*	$121.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				15.90 *T8*
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*	8.10 *P2*	5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R.I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3, T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.425 *A1,T8, M8* 7.525* *M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5*		10.75 *A5*	8.40 *J3*	15.60 *N7*
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1, P11, B9*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3, Y1*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Struthers, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*		5.50 *Y1*			5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, N. Castle, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *B4, M10*			8.40 *S9*	15.55 *S9* 15.60 *N7*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *W5*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*	$140.00 *B2*		6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*					
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

* Electro-galvanized-plus galvanizing extras

(Effective Dec. 18, 1961)

† For details on USS pricing see p. 29

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled 18 ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Electro-galvanized	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.		Cokes▲ 1.25-lb. base box	Electro▲▲ 0.25-lb. base box	Thin 0.25 lb. coating in coils
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*					7.525 *B3*	9.275 *B3*	6.40 *W6, S15*	†Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price 0.75 lb. 0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. ▲ COKES: 1.50-lb. add 25¢. ▲▲ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb. 0.25 lb. add 65¢.		Prices are for 50 lb. base box; for 45 lb. deduct 15¢; for 55 lb. add 15¢; for 60 lb. add 30¢.
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*					7.575 *A2*					
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*						9.325			$9.10 *U1*	$6.25 *U1*
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*		6.775 *B3*		7.525 *B3*	9.275 *B3* 10.025 *B3**	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	$6.25 *B3*
	Worcester, Mass.									6.70 *A5*			
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*		6.775 *A7*		7.525 *A7*					
	Canton-Massillon, Dover, Canfield, Ohio			6.875 *R1, R3*	7.50 *C19*								
	Chicago, Joliet, Ill.	5.10 *W8, A1*						7.525 *W8*		6.40 *A5, R3, W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*		7.65 *R3*	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*	6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*					7.525 *G3*	9.275 *G3*				
	Newport, Ky.	5.10 *A9*	6.275 *A9*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3, Y1*	6.275 *U1, I3, Y1*	6.875 *U1, I3, Y1.*		6.775 *U1, I3, Y1*	7.225 *U1*	7.525 *Y1, I3*	9.275 *Y1*	6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1 Y1,*	$6.25 *U1, I3*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*								$9.20 *G2*	$6.65 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*				7.225 *E2*						
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	7.225 *A7*	6.775 *A7*	7.225 *A7*						
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3*	7.65 *R3*	6.775 *S1*	7.225 *S1†† R3*	7.525 *R3, S1*	9.275 *R3*			$9.10 *R3*	
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	5.10 *U1, J3, P6*	6.275 *U1, J3, P6*	6.875 *U1, J3*	7.50 *E3*	6.775 *U1*		7.525 *J3*	9.275 *J3* 10.125 *J3**	6.40 *A5, J3, P6*	$10.40 *U1, J3*	$9.10 *U1, J3*	$6.25 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3, W5*	6.875 *W3, W5*	7.50 *W3*		7.225 *W3*	7.525 *W3*	9.275 *W3*		$10.40 *W5, W3*	$9.10 *W5, W3*	$6.40 *W5*** $6.25 *W3*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*			6.775 *Y1*		7.525 *Y1*	9.275 *Y1*	6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*					8.25 *K1*	10.40 *K1*		$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*		6.775 *T2*				6.40 *T2, R3*	$10.40 *T2*	$9.10 *T2*	$6.25 *T2*
	Houston, Texas									6.65 *S2*			

Hollowware Enameling
29 ga.—7.85 *U1* at Gary; Pittsburgh; *I3* at Aliquippa; *W5* at Yorkville; *Y1* at Indiana Harbor; *W5* at Wheeling; 7.95 *G2* at Granite City.

* Hi Str. Low Alloy Galv. ** For 55 lb.; for 60 lb. add 15¢.

†† 7.425 at Sharon; Niles is 7.225.

(Effective Dec. 18, 1961)

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.		Listing reinforcing bar prices has been suspended. Major producers now quote prices only in response to specific inquiries.		6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3, S15*		7.70 *B5*	6.725 *B3,R3, S15*	9.025 *B3,B5, S15*	8.30 *B3*	5.30 *B3*				8.00 *W6, S15*
	Claymont, Del.							5.30 *P2*	6.375 *P2*	7.50 *P2*	7.95 *P2*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Milton, Pa.	5.825 *M7*										
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*			6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Steelton, Pa.											
	Fairless, Pa.	5.825 *U1*										
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.							5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7, A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3, T5*	9.025 *R3,R2, T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*		7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *W8, R3*	5.30 *U1,A1, W8,13*	6.375 *U1*	7.50 *U1, W8*	7.95 *W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Medina, Elyria, Ohio	5.675 *R3*		7.65 *A5,C13, W13, B5*		9.025 *A5, C13,W13*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,W13*
	Detroit, Plymouth, Mich.	5.675 *G3*		7.90 *P3* 7.85 *P8B5H2* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5,P8, H2* 9.225 *B5,P3*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*		7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *Y1*	5.30 *U1,I3, Y1*	6.375 *J3, Y1*	7.50 *U1, Y1*	7.95 *Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.											8.10 *C9*
	Sterling, Ill.	5.775 *N4*					7.925 *N4*	5.30 *N4*			7.625 *N4*	8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*		7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Youngstown, Steubenville, O.	5.675 *U1,R3, Y1*		7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *Y1*	5.30 *U1,W5, R3,Y1*		7.50 *Y1*	7.95 *Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.375 *K1*			7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*			6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*		9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, B5*	9.00 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*						6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*										
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*					9.05 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*			7.825 *B2*		9.05 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga. Jacksonville, Fla.	5.875 *A8*										8.00 *A8* 8.35 *M4*
	Fairfield, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*		8.10 *C16*				5.30 *T2,R3*				8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas, Sand Springs, Okla.	5.925 *S2*			6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective Dec. 18, 1961) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Steel Co., Pacific Coast Div.
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brooke Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.
B9 Barry Universal Corp., Detroit, Mich.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C19 Canfield Steel Co., Canfield, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B., Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owensboro, Ky.

H1 Hanna Furnace Corp., Detroit
H2 Hercules Drawn Steel Corp., Toledo, O.

I2 Ingersoll Steel Div., New Castle, Ind.
I3 Inland Steel Co., Chicago, Ill.
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.
M10 Mill Strip Products Co., of Pa., New Castle, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon, Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Div., Bliss & Laughlin, Inc., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.
S14 Screw and Bolt Corp. of America, Pittsburgh, Pa.
S15 Seaway Steel Div., Roblin-Seaway Ind., Inc., North Tonawanda, N. Y.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.
W13 Western Cold Drawn Steel, Div. of Standard Screw Co., Elyria, O.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

STEEL SERVICE CENTER PRICES

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets			Strip	Plates	Shapes	Bars		Alloy Bars			
		Hot-Rolled (18 ga. & hvr.)	Cold-Rolled (15 gage)	Galvanized (18 gage)††	Hot-Rolled		Standard Structural	Hot-Rolled (merchant)	Cold-Finished	Hot-Rolled 4615 As rolled	Hot-Rolled 4140 Annealed	Cold-Drawn 4615 As rolled	Cold-Drawn 4140 Annealed
Atlanta		9.37	10.61	11.83	10.85	9.73	9.94	9.53	13.24	.....	.....	.....	.....
Baltimore	$.10	9.60	10.36	10.16	11.35	9.70	9.95	9.75	11.80	17.48	16.48	21.58	20.83
Birmingham		9.11	11.00	11.39	10.10	9.06	9.12	8.91	13.14	18.84	16.65	22 94	22 19
Boston**	.10	10.00	10.50	11.87	12.50	9.95	10.60	10.15	13.45	17.69	16.69	21.79	21.04
Buffalo**	.15	9.45	10.20	11.95	11.85	9.55	10.05	9.60	11.60	17.45	16.45	21.55	20.80
Chicago**	.15	9.37	10.35	10.28	11.54	9.21	9.72	9.37	10.80	17.10	16.10	21.20	20.45
Cincinnati**	.15	9.53	10.41	10.33	11.86	9.59	10.29	9.48	11.68	17.42	16.42	21.52	20.77
Cleveland**	.15	9.37[1]	10.81	11.07	11.66	9.45	10.11	9.69	11.40	17.21	16.21	21.31	20.56
Denver		11.55	12.53	13.03	13.72	11.39	11.90	11.55	12.98	.....	.....	.....	20.84
Detroit**	.15	9.63	10.61	10.65	11.91	9.58	10.29	9.68	11.16	17.38	16.38	21.48	20.73
Houston**		8.67	9.48	11.35[3]	10.23	8.20	8.31	8.08	13.10	17.50	16.55	21.55	20.85
Kansas City	.15	10.53	11.37	10.95	12.70	10.39	10.91	10.55	11.72	17.17	15.87	21.87	21.12
Los Angeles		10.35[1]	12.15	12.20	12.40	10.30	10.45	10.25	14.20	18.30	17.35	22.90	22.20
Memphis	.15	9.78	10.50	10.95	11.44	9.47	9.82	9.63	12.85	18 59	16 68	22 69	21 04
Milwaukee**	.15	9.51	10.49	10.42	11.68	9.35	9.94	9.51	11.04	17.24	16.24	21.34	20.49
New York**	.10	9.91	10.44	11.64	13.67	9.99	10.45	10.15	13.35	17.50	16.50	21.60	20.85
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	9.90	10.10	10.99	11.55	9.70	10.10	9.95	12.05	17.48	16.48	21.58	20.83
Pittsburgh**	.15	9.37	10.81	11.83	11.64	9.21	9.72	9.37	11.40	17.10	16.10	21.20	20.45
Portland		10.40	12.25	12.35	12.40	10.55	11.00	10.40	16.65	18.60	17.85	22.70	22.15
San Francisco	.10	10.75	11.75[2]	11.95	12.80	10.90	11.20	10.65	15.20	18.30	17.35	22.90	22.20
Seattle		11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.65	22.15
Spokane	.15	11.35	12.45	13.40	12.80	10.95	11.50	10.80	16.20	18.60	17.85	22.65	22.15
St. Louis**	.15	9.57	10.73	10.66	11.74	9.43	9.95	9.59	11.43	17.48	16.48	21.58	20.63
St. Paul	.15	8.97	9.64	10.79	11.14	8.81	9.32	8.97	11.64	.....	16.69	21 79	21.04

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. **These cities are on order quantity pricing. Prices shown are for 2000 lb item quantities of the following: Hot-rolled sheet—10 ga. x 36 x 96—120; Cold-rolled sheet—20 ga x 36 x 96—120; Galv. sheet—10 ga x 36—120; Hot-rolled strip—¼" x 1"; Plate—¼" x 84"; Shapes—I-Beams 6 x 12.5; Hot-rolled bar—Rounds—⅝-2 15/16; Cold-finished bar—C 1018—1" rounds; Alloy bar—hot-rolled 4615—1⅝" to 2⅞"; cold drawn—15/16" to 2⅞" round; Hot-rolled 4140—⅝" to 2⅞" round, cold drawn—15/16" to 2⅞" round.

†† 13c zinc. ‡ Deduct for country delivery. [1] 15 ga. & heavier; [2] 14 ga. & lighter. [3] 10 ga. x 48 — 120.

(Effective Dec. 18, 1961)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	F'dry.	Mall.	Bess.	Low Phos.
Bordsboro, Pa. *B6*	68.00	68.50	69.00	69.50	73.00
Birmingham *R3*	62.00	62.50*	66.50	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	71.50†
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	68.00	68.50	69.00	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	71.00†
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Lyles, Tenn. *T3*	.....	.....	.....	.....	73.00
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Rockwood *T3*	62.00	62.50	66.50	67.00	73.00
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, add $1.00 for 0.31-0.69 pct phos. Add 50¢ per gross ton for truck loading charge.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1, I4*, Toledo, *I4*, $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $89.00; (15.51-16.00), $92.00. Add 75¢ per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 13 pct; 13 to 13.5 pct; 13.5 to 14 pct, add $1. Add $1.00 for each 0.50 pct manganese over 1.00 pct.

† Intermediate low phos.

FASTENERS

(Base discounts, f.o.b. mill, based on latest list prices)

Hex Screws and All Bolts Including Hex & Hex, Square Machine, Carriage, Lag, Plow, Step, and Elevator

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Nuts: Hexagon and Square, Hex, Heavy Hex, Thick Hex & Square

(Discount for 1 container) — Pct

Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

Hexagon Head Cap Screws—UNC or UNF Thread—Bright & High Carbon

(Discount for 1 container)

Plain finish—packaged and bulk.	43
Hot galvanized and zinc plated—packaged	39.25
Hot galvanized and zinc plated—bulk	43

(Minimum plating charge — $10.00 per item. Price on application assembled to bolts.)

Machine Screws and Stove Bolts

(Packages—plain finish)

	Discount Screws	Bolts
Full Cartons	42	42
Machine Screws—bulk		
¼ in. diam or smaller	25,000 pcs	46
5/16, ⅜ & ½ in. diam	15,000 pcs	46

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	25.00	28.25	26.00	29.50	32.00	29.50	47.50	38.00	46.50	—	19.25–21.50	—	19.75–21.75
Billets, forging	—	37.75	38.75	39.50	42.50	39.50	64.50	48.75	57.75	26.75	29.25–26.75	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	46.75	75.75	57.50	67.25	31.50	35.00–31.50	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	42.25	71.75	54.75	64.75	30.00	30.00	31.25–31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	52.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	40.50	68.50	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	43.50	46.75	45.00	49.50	56.75	49.50	76.75	62.25	75.25	40.25	40.25	42.50	38.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	44.25	71.75	54.50	63.75	29.75	33.25–29.75	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6,* Gary, *U1,* (25¢ per lb. higher); Baltimore, Md., *E1* (300 series only).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan, *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8:* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5;* Reading, Pa., *C2;* Bridgeport, Conn., *N8* (down to and including ¼").

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1:* Claymont, Del; *P2.*

Forging billets: Ambridge Pa., *B7;* Midland Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11;* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Reading, Pa., *C2.*

Machine Screw and Stove Bolt Nuts

(Packages—plain finish)

	Discount Hex	Square
Full Cartons	42	54
Bulk		
¼ in. diam or smaller	25,000 pcs	
5/16 or ⅜ in. diam	52	57
	15,000 pcs	
	52	57

Rivets

	Base per 100 *lb*
½ in. diam and larger	$12.85
	Pct Off List
7/16 in. and smaller	11

NOTE: Ferroalloy prices are published in alternate issues.

TOOL STEEL

f.o.b. mill

W	Cr	V	Mo	Co	per lb	AISI
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2

High-carbon chromium	.955	D-3, D-5
Oil hardened manganese	.505	O-2
Special carbon	.38	W-1
Extra carbon	.38	W-1
Regular carbon	.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1960 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

(Effective Dec. 18, 1961)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard & Coated Nails	Woven Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Annl'd ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	173	191	...	212	197	9.00	9.75
Bartonville *K2***	175	193	183	214	199	9.10	9.85
Buffalo *W6*	...	...	...	...	...	9.00	9.55*
Chicago *N4*	173	191	177	212	197	9.00	9.75
Chicago *R3*	...	...	...	...	...	9.00	9.55
Chicago *W7*	173	...	...	...	...	9.00	9.55†
Cleveland *A6*	...	...	...	...	...	...	...
Cleveland *A5*	...	...	...	...	...	9.00	...
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.86
Donora Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	177	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	...	...	...	...	...	...
Houston *S2**	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	175	192	...	214	198	9.10	9.80††
Johnstown *B3***	173	190	177	...	196	9.00	9.675
Joliet Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9**	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	...	...	...	...	...	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Palmer, Mass. *W6*	...	...	...	...	...	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.95	10.50
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	...	...	...	236	...	9.95	10.50
Sparrows Pt. *B3***	175	...	...	215	198	9.10	9.775
Struthers, O. *Y1**	...	...	...	...	...	8.65	9.20
Worcester *A5*	179	...	...	...	...	9.30	9.85
Williamsport *S5*	...	...	...	...	...	...	...

* Zinc at .12¢ a lb. *** .10¢ zinc.
** 13-13.5¢ zinc. † Plus zinc extras
‡ Wholesalers only. †† 0.115¢ zinc.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

STANDARD T. & C.	BUTTWELD														SEAMLESS							
	½ in.		¾ in.		1 in.		1¼ in.		1½ in.		2 in.		2½–3 in.		2 in.		2½ in.		3 in.		3½–4 in.	
	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Youngstown *R3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fontana *K1*	*10.75	*26.00	*7.75	*22.00	*4.25	*17.50	*1.75	*16.75	*1.25	*15.75	*0.75	*15.25	0.75	*15.50								
Pittsburgh *J3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Alton, Ill. *L1*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Sharon *M3*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Fairless *N2*	0.25	*15.0	3.25	*11.0	6.75	*6.50	9.25	*5.75	9.75	*4.75	10.25	*4.25	11.75	*4.50								
Pittsburgh *N1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Wheeling *W5*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Wheatland *W4*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50								
Youngstown *Y1*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
Indiana Harbor *Y1*	1.25	*14.0	4.25	*10.0	7.75	*5.50	10.25	*4.75	10.75	*3.75	11.25	*3.25	12.75	*3.50								
Lorain *N2*	2.25	*13.0	5.25	*9.0	8.75	*4.50	11.25	*3.75	11.75	*2.75	12.25	*2.25	13.75	*2.50	*12.25	*27.25	*5.75	*22.50	*3.25	*20.0	*1.75	*18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Youngstown *R3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Fontana *K1*	*6.25		*2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Alton, Ill. *L1*	4.75	*9.0	8.75	*5.0	11.75	*0.50	12.25	*1.75	12.75	*0.75	13.25	*0.25	13.75	*1.50								
Sharon *M3*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Wheeling *W5*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50
Indiana Harbor *Y1*	5.75	*8.0	9.75	*4.0	12.75	0.50	13.25	*0.75	13.75	0.25	14.25	0.75	14.75	*0.50								
Lorain *N2*	6.75	*7.0	10.75	*3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	*10.75	*24.75	*3.25	*19.0	*0.75	*16.50	4.25	*11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.

Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 12¢ per lb.

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.6
Chicago	140.0
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue. Source: U. S. Pipe and Foundry Co.

COKE

Furnace, beehive (f.o.b.)	Net-Ton
Connellsville, Pa.	$14.75 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.70
Chattanooga, Tenn.	30.80
Ironton, O., f.o.b.	30.50
Detroit, f.o.b.	32.00
New Haven, f.o.b.	31.00
Kearny, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	32.00
Erie, Pa., f.o.b.	32.00
St. Paul, f.o.b.	31.25
St Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

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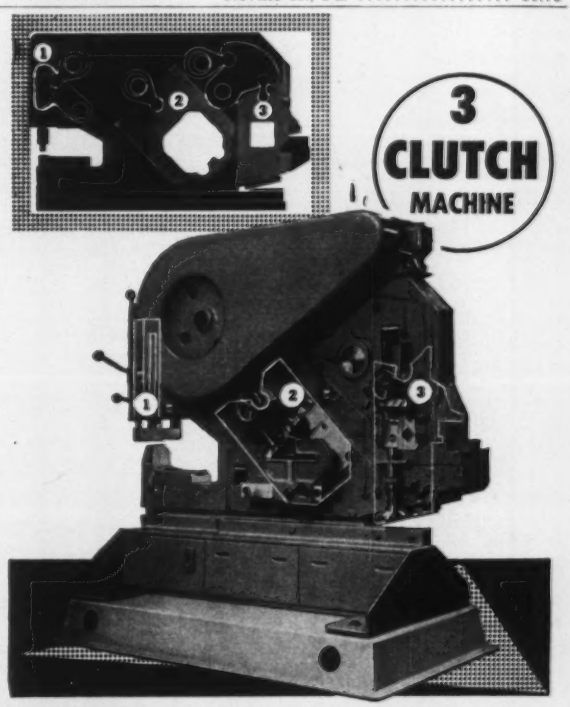

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FERROALLOY PRICES

NOTE: Prices of Boiler Tubes, Clad Steel, C-R Spring Steel, Electrical Sheets, Electrodes, Electroplating Supplies, Metal Powders, Rails and Track Supplies, and Refractories are published in alternate issues.

Ferrochrome

Base prices per lb of contained chromium, carload lots of lump material in bulk, unless noted.

High-Carbon

4.00-6.00% C, 55-63% Cr, 8-12% Si, .03% max S	23.00
4.00-7.00% C, 67-71% Cr, 1-2% Si	24.00
4.25% max C, 58-65% Cr, 1% max Si, .03% max S	24.00
5.25% max C, 58-65% Cr, 3% max Si, .03% max S	22.00

Low-Carbon

2.00% max C, 65-71% Cr, 2% max Si	32.50
.75% max C, 67-73% max Cr, 2% max Si	33.00
.025% max C, 68-73% Cr, 2% max Si	33.50
.05% max C, 67-73% Cr, 2% max Si	33.00
.05% max C, 63-67% Cr, 4-6% Si	32.50

Bricks or Pellets

.025% max C, 63-68% Cr, 4-7% Si	32.50
.025% max C, 68-71% Cr, 2% max Si	33.00
.010% max C, 63-68% Cr, 4-7% Si	33.00
.010% max C, 68-71% Cr, 2% max Si	33.50

High Nitrogen Ferrochrome

Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule.

Ferrochrome Silicon

Carloads, delivered lump, per lb of material.

39-41% Cr, .05% max C, 42-45% Si.	11.50
44-47% Cr, .15% max C, 37-39% Si.	12.60

Chromium Metal

Per lb chromium, contained, packed delivered, ton lots, 97.25% min. Cr, 1% max. Fe.

0.10% max. C	$1.29
9 to 11% C, 88-91% Cr, 0.75% Fe	1.38

Electrolytic Chromium Metal

Per lb of metal 2" x D plate (⅛" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max.

Carloads	$1.15
Ton lots	1.17
Less ton lots	1.19

Calcium-Silicon

Per lb of alloy, lump, delivered, packed. 30-33% Cr, 60-65% Si, 3.00 max. Fe.

Carloads, bulk	24.00
Ton lots	27.95
Less ton lots	29.45

Calcium-Maganese—Silicon

Cents per lb of alloy, lump, delivered, packed.
16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads, bulk	23.00
Ton lots	26.15
Less ton lots	27.15

SMZ

Cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe ½ in. x 12 mesh.

Ton lots	21.15
Less ton lots	22.40

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed max. St. Louis, V-5: 38-42% Cr, 17-19% Si, 8-11% Mn, packed.

Carload lots	18.45
Ton lots	19.95
Less ton lots	21.20

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload bulk	19.20
Ton lots to carload packed	21.15
Less ton lots	22.40

Ferromanganese

Maximum base price, f.o.b., lump size, base content 74 to 76 pct Mn. Carload lots, bulk.

Producing Point	Cents per-lb
Marietta, Ashtabula, O.; Alloy, W. Va.; Sheffield, Ala.; Portland, Ore.	11.00
Houston, Tex.	9.50
Johnstown, Pa.	11.00
Lynchburg, Va.	11.00
Neville Island, Pa.	11.00
Sheridan, Pa.	11.00
Philo, Ohio	11.00
Rockwood, Tenn.	9.50
S. Duquesne	11.00

Add or substract 0.1¢ for each 1 pct Mn above or below base content.

Briquets, delivered, 66 pct Mn:

Carloads, bulk	13.70
Ton lots packed in bags	16.10

Spiegeleisen

Per gross ton, lump, f.o.b., 3% Si max.

Mn	Palmerton, Pa. 10 lb, pig	35 lb, down	Neville Is., Pa. 35 lb
16-19%	$98.00	$96.00	$100.50
19-21%	100.00	98.00	102.50
21-23%	102.50	100.00	105.50

Manganese Metal

2 in. x down, cents per pound of metal delivered.

95.50% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.

Carload, packed	45.75
Ton lots	47.25

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound.

Carloads, bulk	34.25
Ton lots, palletized	36.25
250 to 1999 lb	39.00
Premium for Hydrogen - removed metal	0.75

Medium Carbon Ferromanganese

Mn 80 to 85%, C 1.25 to 1.50, Si 1.50% max., carloads, lump, bulk, delivered, per lb of contained Mn 24.00

Low-Carb Ferromanganese

Cents per pound Mn contained, lump size, packed, del'd Mn 85-90%.

	Carloads Ton		Less
0.07% max. C, 0.06% (Bulk) P, 90% Mn	37.15	39.95	41.15
0.07% max. C	35.10	37.90	39.10
0.10% max. C	34.35	37.15	38.35
0.15% max. C	31.10	33.90	35.10
0.30% max. C	29.80	32.60	33.80
0.50% max. C	28.50	31.30	32.50
0.75% max. C, 80.85% Mn, 5.0-7.0% Si	27.00	29.80	31.00

Silicomanganese

Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.3¢ f.o.b. shipping point.

Carloads bulk	11.60
Ton lots, packed	13.25
Carloads, bulk, delivered, per lb of briquet	14.00
Briquets, packed pallets, 2000 lb up to carloads	16.40

Silvery Iron (electric furnace)

Si 15.50 to 16.00 pct., f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $106.50 gross ton, frieght allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $93.00.

Silicon Metal

Cents per pound contained Si, lump size, delivered, packed.

	Ton lots,	Carloads,
98.25% Si, 0.50% Fe	22.95	21.65
98% Si, 1.0% Fe	21.95	20.65

Silicon Briquets

Cents per pound of briquets, bulk, delivered, 40% Si, 2 lb Si, briquets.

Carloads, bulk	8.00
Ton lots, packed	10.80

Electric Ferrosilicon

Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point.

50% Si	14.50	75% Si	16.90
65% Si	15.75	85% Si	18.60
		90% Si	20.00

Ferrovanadium

50-55% V delivered, per pound, contained V, in any quantity.

Openhearth	3.20
Crucible	3.30
High speed steel	3.40

Calcium Metal

Eastern zone, cents per pound of metal, delivered.

	Cast	Turnings	Distilled
Ton lots	$2.05	$2.95	$3.75
100 to 1999 lb	2.40	3.30	4.55

(Effective Dec. 18, 1961)

Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y. per lb.

Carloads, bulk	9.85¢
Ton lots	11.20¢

Calcium molybdate, 43.6-46.6% f.o.b. Langeloth, Pa., per pound contained Mo $1.63

Ferrocolumbium, 58-62% Cb, 2 in. x D, del'd per lb con't Cb

Ton lots	$3.45
Less ton lots	3.50

Ferro-tantalum-columbium, 20% Ta, 40% Cb, 0.30% C, del'd ton lots, 2-in. x D per lb con't Cb plus Ta $3.40

Ferromolybdenum, 55-75%, 200-lb containers, f.o.b. Langeloth, Pa., per pound contained Mo $1.89

Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $5.00 unitage, per gross ton $120.00
10 tons to less carload $131.00

Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Vanadis, O., O., freight allowed, ton lots, per lb contained Ti $1.35
Less ton lots (200 lb and up) $1.37

Ferrotitanium, 30% low carbon, 0.10% C max., 27-32% Ti, Vanadis, O., freight allowed, per lb contained Ti, ton lots $1.35
Less ton lots (200 lb and up) $1.40

Ferrotitanium, 1-3% Carbon, 17-20% Ti, f.o.b. shipping point, freight allowed, carload per net ton $250.00
Ton lots $260.00

Ferrotungsten, ¼ x down packed per pounds contained W, ton lots delivered ..... $2.45 (nominal)

Molybdic oxide, briquets per lb. contained Mo, f.o.b. Langeloth, Pa. $1.62
bags, f.o.b. Washington, Pa., Langeloth, Pa. $1.59

Simanal, 20% Si, 20% Mn, 20% Al, f.o.b. Philo, Ohio, freight allowed per lb.

Carload, bulk lump	18.50¢
Ton lots, packed lump	20.50¢
Less ton lots	21.00¢

Vanadium oxide, 86-89% V_2O_5 per pound contained V_2O_5 ..... $1.38

Zirconium silicon, per lb of alloy

35-40% del'd, carloads, bulk	26.25¢
12-15%, del'd lump, bulk-carloads	9.25¢

Boron Agents

Borosil, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B
2000 lb carload $5.50

Ferro Zirconium Boron, Zr 50% to 60%, B 0.8% to 1.0%, Si 8% max., C 8% max., Fe balance, f.o.b. Niagara Falls, New York, freight allowed, in any quantity per pound ..... 30¢

Corbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed.
Ton lots per pound ..... 18.25¢

Ferroboron, 17.50 min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D, ton lots... $1.20
F.o.b. Wash., Pa., Niagara Falls, N. Y., delivered 100 lb up

10 to 14% B	.85
14 to 19%	1.20
19% min. B	1.50

Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb & over

No. 1	$1.05
No. 79	50¢

Manganese-Boron, 75.00% Mn, 17.50% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd

Ton lots (packed)	$1.46
Less ton lots (packed)	1.57

Nickel-Boron, 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, del'd less ton lots 2.15

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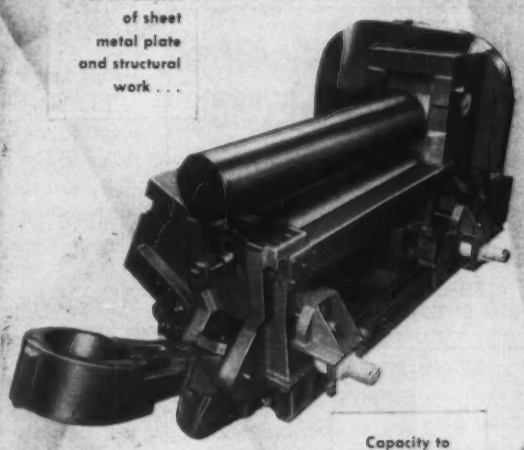

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3000' Belt Conveyor 30" & 36"
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No. 3 Niagara Angle Bending Roll, M.D.
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New York Upsurge Encourages Dealers

Used machinery dealers see some improvement in business in the New York area. They are optimistic about sales in the first quarter of 1962.

Demand is rising for heavy fabricating machinery, and general inquiries are running high.

■ New York area dealers are encouraged about some recent improvement in business. And they are optimistic about the prospects for early 1962.

The current upturn seems mainly due to more subcontracting work for the small machine shops. As a result more of these buyers are in the market for equipment.

Factor Cited — Demand is up especially for heavy fabricating machinery — including bending rolls, press brakes, and heavy shears. Dealers are convinced the faster pace of defense production is a strong factor in the upturn.

Even when the subcontractors want to swap machines (sell some items to buy others), this means activity for the dealers. And when the purchase involves getting production equipment without any "trade-ins," the prospect for dealers is even better.

Foreign Money—There's another encouraging aspect to the market: More foreign buyers are coming into the Eastern U. S. market to purchase. Usually they can fill their needs at home, but now their overseas orders are up.

One dealer cites the case of a foreign buyer looking for a heavy press. Unable to locate one, he turned to the U. S. market.

Price differentials are less a factor when comparing the cost of U. S. used machines and foreign-made used machines. This is an aid to dealers in making sales.

Some Problems—However, there are still some drawbacks in international used machinery sales. Buyers may have some difficulties working out financing, and variations in money rates can slow down transactions.

Aside from the increased demand for heavy fabricating equipment, the market is static. One dealer describes over-all demand as "spotty." Another says buying by industry in general is "not so hot."

There are strong hopes, however, that sales will improve during the early part of '62. This should reflect the general improvement in business. In addition, dealers point to the expected buildup in steel operations. Whenever the mills are operating at a good rate, there's more confidence among both used machine buyers and sellers.

"Somehow I just can't see this as part of the gross national product."

ROLLING MILLS—STEEL WORKS EQUIPMENT

1—38" CONTINUOUS HOT STRIP MILL.
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1—3-HIGH PLATE MILL, 40" & 28½" x 112".
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2—10" x 14" 2-HIGH COLD MILLS, 100 HP DC drives, with one coiler.
1—18" BAR MILL, 3-high, single stand, NEW.
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1—9" BAR MILL, 3-high, five stands.
1—VERTICAL OPEN-SIDE BAR SHEAR, 28".
2—SQUARING SHEARS for ¼" x 156" sheets.
1—STRAIGHTENER, SUTTON NO. 1 SPECIAL, for bars ¼" to 1½", tubes ¼" to 2".
1—LEVELLER FOR ¼" PLATES, 9 rolls, 9" dia. x 108" face, 20 HP motor.
1—LEVELLER FOR SHEETS, 17 rolls, width 66", rolls 4½" dia., 25 HP motor.
1—AUTOMATIC SQUARING SHEAR UNIT for sheets, 180" side cut, 62" end cut.
1—ROLL GRINDER, 36" x 12", heavy duty, crowning, cornering and tapering.
1—50" ROLL LATHE, enclosed headstock, tailstock, 50 HP motor, 19' between centers, bed length 31'.
1—ROLL LATHE, enclosed headstock, rolls 14" to 28" dia., 50 HP motor, bed length 21'.
2—42" WIDE COIL BUILD-UP LINES.
1—3000 HP GEAR DRIVE, ratio 2.68 to 1.
1—3000 HP GEAR DRIVE, ratio 4.6 to 1.
1—1800 HP GEAR DRIVE, ratio 10 to 1.
1—400 HP GEAR DRIVE, ratio 8.2 to 1.
1—4000 HP MOTOR, 11200/3/90, 510 RPM.
1—3500 HP MOTOR, 11000/3/60, 514 RPM.
1—1600 HP MOTOR, 2200/3/60, 270 RPM.
1—400 HP MOTOR, 2300/4000/3/90, 450 RPM.
1—7½-TON SOAKING PIT CRANE, 85' span.

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25, 45, & 65 Ton Diesel Electric Locomotives
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4400 KW RECTIFIERS
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Electrical Characteristics

INPUT: 2—4400 KVA TRANSFORMERS
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Secondary 275 to 86 V. with 34 Variable Taps—Changed under load
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Primary 4160 V. Delta; Secondary 277 V. to Neutral with INTERPHASE REACTORS
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4400 KW 86 to 275 V. or
2200 KW 172-550 V.

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• ARC MELTING FURNACES

500# LECTROMELT—DOOR CHARGE amplidyne controls. Like new
500# LECTROMELT—DOOR CHARGE

250# LECTROMELT—185 KVA
1000# SWINDELL—500 KVA
3000# HEROULT Door Charge
7' TOP CHARGE—2000 KVA
9' TOP CHARGE Swindell
11' TOP CHARGE—4000 KVA
DETROIT FURNACES—10 lb. to 300 lb. Cap.

• INDUCTION HEATING FURNACES

50 KW; 80 KW; 100 KW 2 station 9600 cy.—
15 KW GIRDLER Dieilectric Heater
20 KW THERMONIC Induction Heater 2 station
20 KW ECCO Induction Heater

• CRANES

5 ton-50'-AC. W/300' of "A" Frame Runway, M.G. Set, Magnet, Bucket.

• INDUCTION MELTING FURNACES

175 KW AJAX Induction Mltg. Installation Ideal for non-ferrous work. With 2 lift coils, has tilting furnace for steel melting
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4—PANGBORN 2EZ Hydrofinish Cabinets Like New—Ideal for Wet Blasting Operation, cleaning forging dies or fine finishing

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48x42 WHEELABRATOR w/loader
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Farm Implements—Feeders
Hoppers—Bins
Continuous Cleaners—Dryers
Steel Swimming Pools
Drilling and Mining Structural Steel

Further information will be submitted upon request.

BOX H-242
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By a Prominent Manufacturer. A Machine Shop Superintendent with experience as an administrator of a multi-shop operation involved in heavy machinery.

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c/o IRON AGE, Chestnut at 56th, Phila. 39

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ENGINEER, experienced in estimating, design, purchasing, manufacturers representation, desires new connection in metal fabrication, machinery, materials handling or construction fields. Will relocate, Northeastern U.S. preferred. Write to Box H-247, c/o IRON AGE, Chestnut at 56th, Phila. 39.

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PLANT SUPERINTENDENT

College graduate preferred, but must have had at least 5 years experience as superintendent of a plate steel fabricating shop. Thorough knowledge of all machine operations and all types of welding important. Must be able to plan production for efficient operations and constantly work for lower costs. Plant presently employs approximately 125 men and located in Eastern Pennsylvania. Men with only structural steel experience need not apply. Applicant should supply full background resume and salary. Excellent opportunity for right man. Interested applicants will receive consideration on a confidential basis by replying to

BOX H-243
c/o IRON AGE, Chestnut at 56th, Phila. 39

AAAA DIVERSIFIED MANUFACTURING AND DISTRIBUTING ORGANIZATION requires aggressive experienced representatives throughout country to sell imported steel, metals, for newly established import department.

BOX H-244
c/o IRON AGE, Chestnut at 56th, Phila. 39

EQUIPMENT AND MATERIALS WANTED

WANTED

Rolling Mill and Pinion Stands, one three high and one two high 20 to 30 inch roll diameter with drive if available. Eastern Delivery.

Box H-245
c/o IRON AGE, Chestnut at 56th, Phila. 39

WEISS STEEL CO., INC.
600 WEST JACKSON BLVD.
CHICAGO 6, ILLINOIS CEntral 6-1936
Buyers of Surplus Steel and Machinery Inventories

WANTED
SURPLUS STEEL
WALLACK BROTHERS
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GROVEHILL 6-7474

WANTED

1 each Cincinnati No. 2 and No. 3 (Model LL or LR preferred) canterless grinder and long bar fixture for each for grinding 12 ft.-18 ft. lengths.

and

1 only abrasive saw for wet-cutting titanium and high alloy steel bars up to 4½" Dia. on a production basis. Approximate requirements include:

20"-22" Dia. abrasive blade (6500-9500 FPM surface speed).
Manual feed complete with blade oscillating device. Coolant pump.
Quick operating manual or power operated clamp. 15-HP drive motor.

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WANTED TO PURCHASE—any quantity
CARBON—ALLOY—STAINLESS
Bars—Billets—Sheet—Plate
THE GILBERT MERRILL STEEL CORP.
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NEW *WANTED* USED
Structurals, Plate, Pipe and Tubing
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P. O. Box 270, RACINE, WISCONSIN

WANTED
BRIDGE CRANES
ARNOLD HUGHES COMPANY
2765 PENOBSCOT BLDG., DETROIT, MICH.
WOodward 1-1894

WANTED

Drawbench for bars and/or tubes. Advise pounds capacity length and full details.

Box H-246
c/o IRON AGE, Chestnut at 56th, Phila. 39

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K
SINCE 1895

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New ROTOBLAST saves labor cost of five men

Cost-cutting Rotoblast knocks out heavy core sand and rods, above, in large castings at Elyria Foundry. Inset: cleaned castings are moved to next operation while second table-load is being Rotoblasted.

One man and one new ROTOBLAST twin table room do the same amount of blast cleaning work *better* than six men did with previous blast equipment at Elyria Foundry Division, Chromalloy Corporation, Elyria, Ohio. Among extra benefits: new high capacity abrasive separation (equipment on core-knockout ROTOBLASTS) handles core removal right along with blast cleaning, removing a ton of sand an hour from spent abrasive.

Whatever your cleaning needs, a standard or specially designed Rotoblast unit can cut your manpower and operating costs. Full automation can be built in. Easy installation, simple maintenance and fast, thorough cleaning are regular features of Rotoblast.

TRY ROTOBLAST ABRASIVES, TOO!

You can clean castings faster — at lower cost per ton — with solid, tough Rotoblast Steel Shot and Grit. No wonder! The development of this modern abrasive by Pangborn is based on nearly 60 years' experience supplying industry's blast cleaning needs. We'll be glad to go into more detail. Just write:

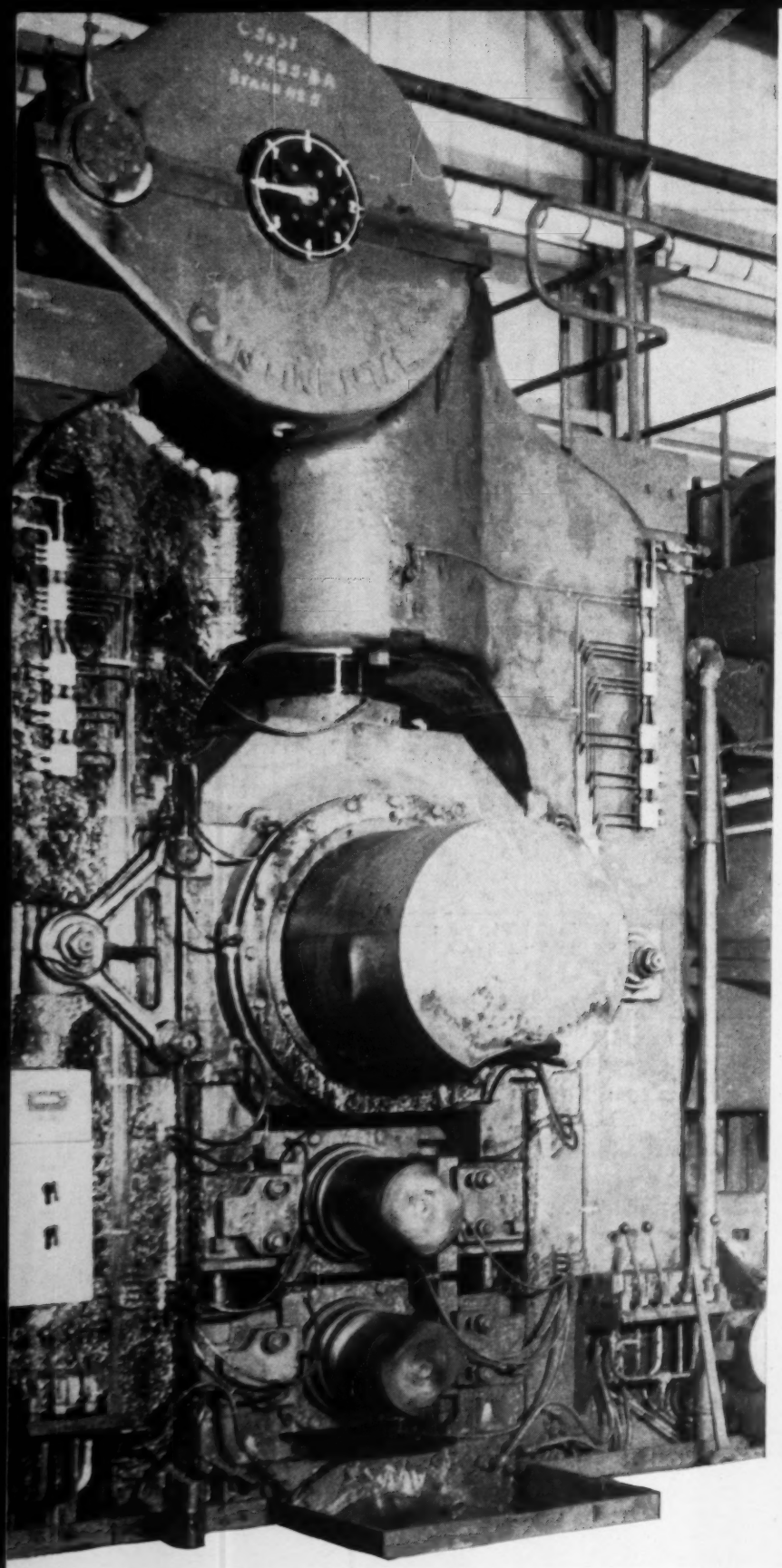
PANGBORN CORPORATION, 1500 Pangborn Blvd., Hagerstown, Md.; Pangborn Canada, Ltd., 47 Shaft Rd., Toronto (Rexdale), Canada; or phone district office in Yellow Pages under "Sand Blast Equipment." *Manufacturers of Blast Cleaning, Vibratory Finishing, Dust and Fume Control Equipment —Rotoblast® Steel Shot and Grit℠.*

Operation ROTOBLASTING

(BEST IN BLAST CLEANING)

Pangborn

OF HAGERSTOWN

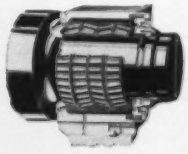


ARMCO specifies tapered roller bearings for their hot strip mill back-up rolls

Armco's 25″ & 54″ x 58″ five stand tandem hot strip mill installed in 1955 at their Butler, Pa., plant has operated without the loss of a single tapered roller back-up roll bearing. And operating expenses have been low on lubrication system maintenance and cost of lubricant. Mill downtime due to failure of bearings and lubricating system is non-existent.

Along with economy, tapered roller bearing equipped back-up rolls have provided a number of other positive benefits. They maintain positive roll location and there is minimum slippage and wear on mill rolls because of lower starting torque. Tapered roller bearings provide higher momentary overload capacity.

For the most in bearing performance and engineering service when you buy or build a mill, specify Timken® bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits. Canadian Division: Canadian Timken, St. Thomas, Ontario.



Industry rolls on

TIMKEN®

tapered roller bearings